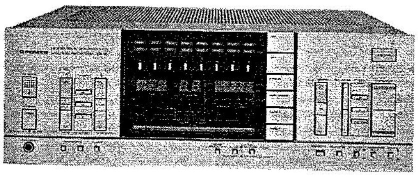
PIONEER®

Service Manual



ORDER NO.
ARP-042-0

GA - S

21. NOV. 1994

Sänger

COMPUTER CONTROLLED STEREO RECEIVER

SX-9

- This service manual is applicable to the S/G type (U.S. Military model).
- For the adjustments, please refer to the model SX-8/KU service manual (ARP-043).
- For the circuit descriptions, please refer to the model SX-9 service manual (ARP-088).

CONTENTS

1. SPECIFICATIONS 2
2. FRONT PANEL FACILITIES 3
3. BLOCK DIAGRAM 7
4. P. C. BOARDS CONNECTION DIAGRAM 11
5. SCHEMATIC DIAGRAM 18
6. ELECTRICAL PARTS LIST 24
7. PACKING 29
8. EXPLODED VIEW 30

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1. SPECIFICATIONS

Power Amplifier Section

Continuous Average Power Output is 125 watts per channel, min., at 8 ohms from 20 Hertz to 20,000 Hertz with no more than 0.005% total harmonic distortion.

Total Harmonic Distortion (20 Hertz to 20,000 Hertz, 8 ohms)
  continuous rated power output: No more than 0.005%
  62.5 watts per channel power output
  .... No more than 0.005%
Intermodulation Distortion (50 Hertz : 7,000 Hertz = 4:1)
  continuous rated power output: No more than 0.005%
  62.5 watts per channel power output
  .... No more chan 0.005%
Frequency Response ... 5 Hertz to 450,000 Hertz $^{+0}_{-3}$ dB
Input Sensitivity/Impedance (POWER AMP IN)
  .... 1V/50 kilohms
Output: Speaker .... A,B, A series B
Damping Factor (20 Hertz to 20,000 Hertz, 8 ohms): 50
Hum and Noise (IHF, short-circuited, A network): 115dB

Preamplifier Section

Input (Sensitivity/Impedance)
  PHONO MM .... 2.5 mV/50 kilohms
  PHONO MC .... 0.25 mV/100 kilohms
  AUX/VIDEO, TAPE PLAY 1,2, ADAPTOR IN
  .... 150mV/50 kilohms
Phono Overload Level (T.H.D. 0.009%, 1,000 Hertz)
  PHONO MM 150mV
Output (Level/Impedance)
  TAPE REC 1, 2, ADAPTOR OUT . . 150 mV/2.2 kilohms
  PREAMP OUT (R_L : 50 kilohms)
  .... rated 1V/1 kilohms
Frequency Response
  PHONO (RIAA Equalization)
  .... 20Hz to 20,000 Hertz±0.3 dB
  AUX, TAPE PLAY 1,2, ADAPTOR IN
  .... 5Hz to 100,000 Hertz $^{+0}_{-3}$ dB
Tone Control
  BASS .... ± 10dB (100Hz)
  TREBLE .... ±10dB (10kHz)
Subsonic Filter 15Hz (6dB/oct.)
Loudness Contour (Volume control set at –40dB position)
  .... +6dB (100Hz), +3dB (10,000Hz)
Hum and Noise (IHF, short-circuited, A network)
  PHONO MM/MC 80dB/67dB
  Muting .... –25dB

FM Tuner Section

Usable Sensitivity (IHF) Mono; 10.3dBf (0.9µV, 75 ohms)
50 dB Quieting Sensitivity
  .... Mono; 15.7dBf (1.6µV, 75 ohms)
  Stereo; 37dBf (19.5µV, 75 ohms)
Signal-to-Noise Ratio .... Mono; 80dB (at 85 dBf)
  Stereo; 76dB (at 85 dBf)
Distortion (at 65 dBf)
  MONO 100Hz 0.1%
  1kHz 0.07%
  6kHz 0.15%
  STEREO 100Hz 0.15%
  1kHz 0.1%
  6kHz 0.2%
Capture Ratio 1.0dB
Alternate Channel Selectivity 400kHz; 80dB
Stereo Separation .... 1kHz; 45 dB
  30Hz to 15kHz; 35dB
Frequncy Response .... 20Hz to 15kHz±0.5dB
Spurious Response Ratio 90dB
Image Response Ratio 80dB
IF Response Ratio 90dB
AM Suppression Ratio 55dB
Subcarrier Product Ratio 55dB
SCA Rejection Ratio 60dB
Muting Threshold .... 29.3dBf (8µV, 75 ohms)
Antenna Input . . 300 ohms balanced, 75 ohms unbalanced

AM Tuner Section

Sensitivity (IHF, Ferrite antenna) 300µV/m
  (IHF, Ext. antenna) 15µV
Selectivity 27dB
Signal-to-Noise Ratio 50dB
Image Response Ratio 40dB
IF Response Ratio 80dB
Antenna .... Ferrite loopstick antenna

Miscellaneous

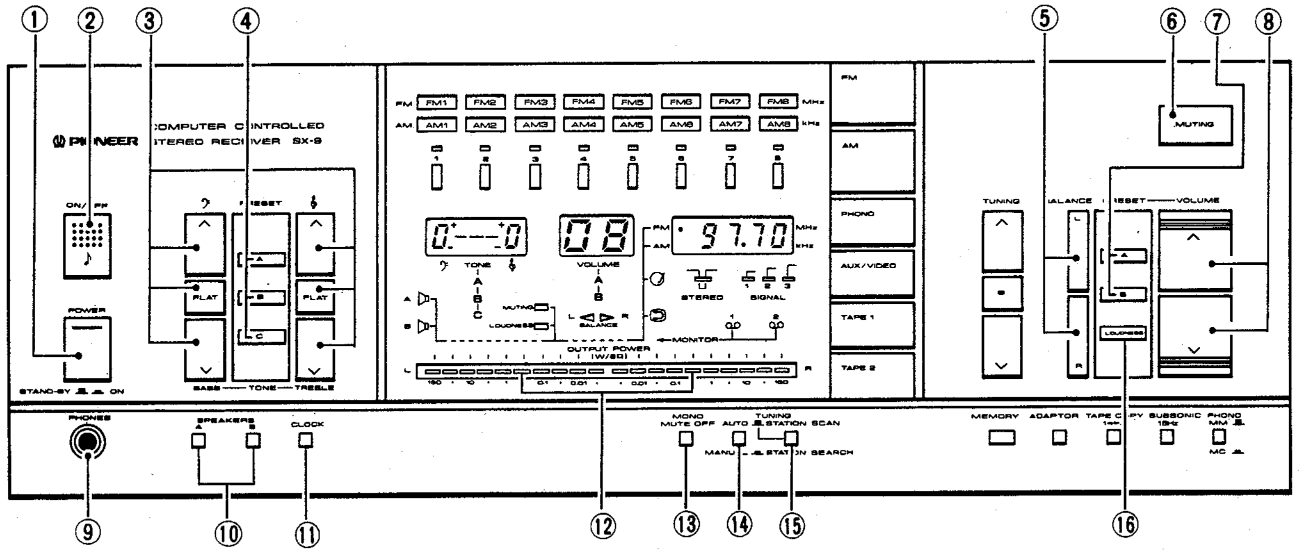
Power Requirements .... AC 110/120/220/240V
  (switchable), 50/60Hz
Power Consumption 300W
Dimensions .... 420(W) x 151(H) x 448(D) mm
  16-9/16(W) x 5-15/16(H) x 17-5/8(D) in
Weight (without package) .... 15.1 kg (33 lb 5 oz)

Furnished Parts

FM T-type Antenna 1
Station Card 5
Fuse 2
Operating Instructions 1

NOTE:
Specifications and the design subject to possible modifications without notice due to improvements.

2. FRONT PANEL FACILITIES



① POWER SWITCH (STAND-BY ▀ , ON ▄)

When this switch is depressed to the ON position, power is supplied to all the circuits. When released to the STAND-BY position, the power to the main circuits is cut off but still supplied to the clock. The clock continues to function until the power cord is disconnected.

NOTES:

- *Immediately after the power switch has been depressed to ON, the protection circuit is activated and no sound is heard through the speakers. The VOLUME STEP display blinks at the volume level heard before as a warning. When the numbers of the two digits blink, the output can be expected to be high. In this case, depress the VOLUME control " ∨ " and reduce the numerical display.*
- *Even when the power cord has been disconnected, the STATION CALL switch, PRESET-VOLUME and PRESET-TONE presetting information in the memory is preserved for about one week.*
  When the presetting information has been erased from the memory, follow the relevant instructions and proceed with presetting again.

② SOUND INDICATOR

Almost all the switches on the SX-9's front panel make an electronic beep sound when pressed, thanks to a function built into the unit. When this switch is depressed, the beep is heard when the control switches are pressed; when it is depressed again, the sound is no longer heard.

③ TREBLE, BASS TONE CONTROLS

These controls are used to adjust the treble and bass level to your preference. To enhance the treble and bass response, depress the " ∧ " control; to attenuate the response, depress " ∨ ". The increase or reduction in the response can be monitored on the ㉖ TONE CONTROL STEP display 𝄢 and 𝄞 . The response itself can be varied in 7 steps in either the "+" or "–" direction. When the center FLAT control is depressed, the treble frequency response is made flat.

④ PRESET-TONE SWITCHES

Switches A, B and C can memorize the bass and treble frequency responses which you have set to your preference, along with the ㊳ MEMORY switch, in three patterns (A, B and C). The bass and treble levels are set using the ③ TREBLE, BASS TONE controls while observing the ㉖ TONE CONTROL STEP display 𝄢 and 𝄞 . When the ㊳ MEMORY switch is depressed, the PRESET-TONE indicator starts to blink. When PRESET-TONE switch A, B or C is depressed, the set frequency response pattern is memorized in the switch. After having completed the memory operation, all you have to do to recall the frequency response which you have set is depress switch A, B or C.

⑤ BALANCE CONTROLS

These controls are used to adjust the balance in the volume of sound heard through the left and right speakers. When the sound tends to be louder at the left speaker, depress the R control; when it tends to be louder at the right speaker, depress the L control. When no sound is being delivered through the speakers, the balance can be checked by the ㉛ BALANCE indicators (L ◁ or ▷ R). Normally, both controls are depressed simultaneously and set to the center position (L ◁ and ▷ R light).

⑥ MUTING SWITCH

Depress this switch to attenuate the audio output indicated on the ㉜ VOLUME STEP display by 25dB. There is no need to adjust the VOLUME level when turning down the audio output temporarily and when changing over records or tapes.

⑦ PRESET-VOLUME SWITCHES

Switches A and B can memorize the volume level which you have set to your preference, along with the ㊳ MEMORY switch, at two levels. The volume level is set using the ⑧ VOLUME controls while observing the ㉜ VOLUME STEP display. When the ㊳ MEMORY switch is depressed, the PRESET-VOLUME indicator starts to blink. When PRESET-VOLUME switch A or B is depressed, the set volume level is memorized in the switch. The PRESET-VOLUME indicator changes blinking to lighting. After having completed the memory operation, all you have to do to recall the volume level which you have set is depress switch A or B.

⑧ VOLUME CONTROLS

Use these controls to adjust the output level to the speakers and headphones. Depress the ∧ switch to increase the output level. Depress the ∨ switch to decrease the output level.

NOTE:
By adjusting the VOLUME controls in combination with the MUTING switch, it is possible to adjust the volume more finely across a very wide range.

⑨ PHONES JACK

Plug the headphones plug into this jack when you want to listen through your stereo headphones.
Release both SPEAKERS switches if you want to listen to the sound through your headphones only.

⑩ SPEAKERS SWITCHES

Depress the switch corresponding to the speakers connected to the SPEAKERS terminals (A and B) on the rear panel. "A" refers to the speakers which have been connected to the A SPEAKERS terminals while "B" refers to the speakers which have been connected to the B SPEAKERS terminals.

NOTE:
No sound will be heard through the speakers when both A and B switches are depressed if only one set of speakers has been connected to either A or B SPEAKERS terminals.

⑪ CLOCK SWITCH

The time appears on the ⑲ FREQUENCY/CLOCK display when this switch is depressed. The display changes when the AM or FM switch is depressed. To adjust the present time, keep this switch in the depressed position and adjust using the ㉓ TUNING controls (∧ or ∨).

⑫ OUTPUT POWER METER

This meter allows you to read out the rated power level on the bar display when speakers with a nominal impedance of 8 ohms are connected to the SPEAKERS terminals.

⑬ MONO MUTE OFF SWITCH

The sound is heard in mono when this switch is set to the depressed position. Normally, the switch is kept at the released position. During FM or AM reception, the noise is reduced and reception is made clear. When the station is distant and its signals are weak, depress the switch and tune in the station manually.

⑭ AUTO/MANUAL SELECTOR

This is used to select the reception mode.

AUTO (released position): Auto tuning is selected in accordance with the position selected by the STATION SCAN/STATION SEARCH selector on the right.

MANUAL (depressed position):
Depress the TUNING controls and tune in the station manually. Each time the TUNING controls are depressed, the frequency changes in 100kHz steps during FM reception and in 9kHz or 10kHz steps during AM reception in accordance with the position of the AM CHANNEL STEP switch. When the TUNING controls are kept depressed, the frequency is continuously scanned. Tuning stops when the upper or lower limit of the frequency band is reached.

⑮ STATION SCAN/STATION SEARCH SELECTOR

This is used to select the auto tuning mode when the AUTO/MANUAL selector on the left is at AUTO.

STATION SCAN (released position): When the TUNING controls are depressed, the broadcasting stations start to be scanned and this procedure stops once a station has been picked up, and the program of that station is heard for about 5 seconds. After 5 seconds, the tuning operation then resumes and sound is heard in the same way. Each of the station is thus picked up in turn.
When the ㉘ Frequency stop " ■ " switch is depressed once you hear the sound of the desired program, the tuning operation stops and the unit is set to the reception mode.

STATION SEARCH (depressed position): When the TUNING controls are depressed, the broadcasting stations start to be scanned, but this operation stops once a station has been picked up and the unit is set to the reception mode. Depress the TUNING controls again if the station picked up is not the one desired. The tuning operation now starts over again.

⑯ LOUDNESS SWITCH

When listening to a performance with the VOLUME level is low, depress this switch and the bass and treble will be accentuated.
When the volume is low, the human ear finds it harder to hear the bass and treble than when the volume is high. The LOUDNESS switch is thus designed to compensate for this deficiency.

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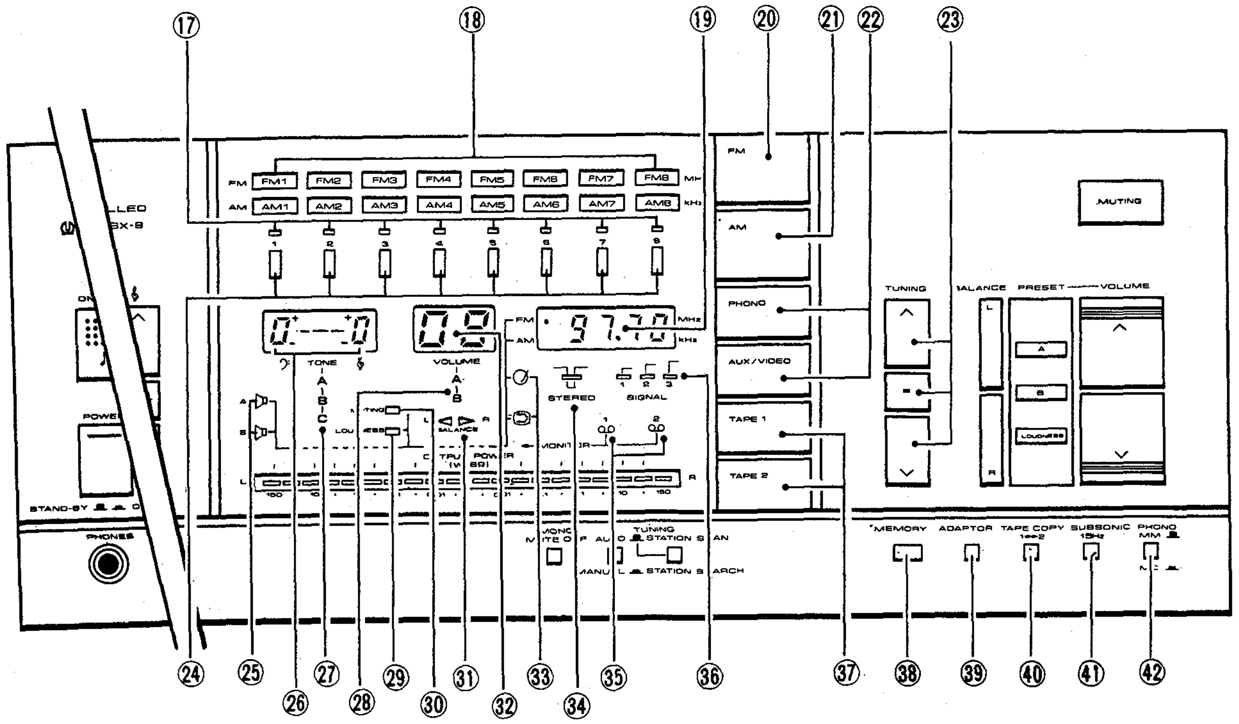


⑰ STATION INDICATORS

The indicator that corresponds to the STATION CALL switch which has been depressed lights.

NOTE:
When presetting a station, all eight indicators light in sequence for about 5 seconds.

⑱ STATION DISPLAY WINDOWS

Insert the frequency cards of the broadcasting stations which have been preset into the STATION CALL switches.

⑲ FREQUENCY/CLOCK DISPLAY

This indicates the broadcasting frequency when a station has been tuned in. When the clock switch is depressed, it indicates the present time.

NOTE:
When the power is switched off, the present time is displayed.

⑳ FM SWITCH

Depress this switch for FM reception.

㉑ AM SWITCH

Depress this switch for AM reception.

㉒ INPUT SELECTOR

PHONO:	Depress this switch when playing a record on the turntable connected to the PHONO jacks.
AUX/VIDEO:	Depress this switch when listening to an audio component connected to the AUX VIDEO jacks.

㉓ TUNING CONTROLS

These controls are used to tune in the broadcast stations. Depress the " ∧ " control to tune in a station with a higher frequency than that indicated on the display; depress the " ∨ " control to tune in a station with a lower frequency. Frequency stop " ■ " switch is used to suspend auto tuning operations using the STATION SEARCH and STATION SCAN functions.

NOTE:
For further details on the tuning, refer to the ⑭ AUTO/MANUAL SELECTOR.

㉔ STATION CALL SWITCHES

These are pressed to call out preset broadcasting stations or to preset the station.

To call out a station, first set the desired frequency band using the FM or AM switches and then press the desired switch.

㉕ SPEAKERS INDICATORS (A/B)

These light when SPEAKERS switch (A and/or B) has been depressed.

㉖ TONE CONTROL STEP DISPLAY
(𝄢 TONE 𝄞)

This display indicates the level of the frequency response which has been increased or reduced using the TONE CONTROLS by the two symbols (𝄢 and 𝄞)," Γ " and " L " and numbers in 7 steps. " 𝄢 " indicates the bass range while 𝄞 indicates the treble range.

㉗ PRESET-TONE INDICATORS (A/B/C)

These indicators blink when the frequency response curves are memorized using the PRESET memory function, and they light when the curves are recalled using the PRESET-TONE switches to indicate that the curves have been memorized.

㉘ PRESET-VOLUME INDICATORS (A/B)

These indicators blink when the volume, loudness and muting level are memorized using the PRESET memory function, and light when the level is recalled using the PRESET-VOLUME switches to indicate that the level has been memorized.

㉙ LOUDNESS INDICATOR

This lights when the LOUDNESS switch is depressed. It also lights up to indicate that the loudness level has been memorized using the PRESET memory function.

㉚ MUTING INDICATOR

This lights when the MUTING switch is depressed. It also lights up to indicate that the muting level has been memorized using the PRESET memory function.

㉛ BALANCE INDICATOR

This lights as the BALANCE CONTROLS are operated. The arrows indicate whether the sound tends to be louder at the left or right speaker. When both the L and R arrows light, this indicates that the balance has been set to the center position.

㉜ VOLUME STEP DISPLAY

This display indicates the volume level in 32 steps from 00 to 31 in accordance with the adjustment of the VOLUME controls.

NOTE:
When the power is switched on, the volume step display blinks to indicate the volume level. After blinking, the volume step lights.

㉝ INPUT INDICATORS

These light when the ㉒ INPUT (PHONO or AUX/VIDEO) switch is pressed.

㉞ FM STEREO INDICATOR

This lights when receiving an FM stereo program.

㉟ TAPE INDICATOR (1, 2)

This indicates the tape deck which is playing back in accordance with the position selected by the TAPE 1, 2 switches.

㊱ SIGNAL INDICATOR

This indicator lights in sequence from 1 to 3 during the tuning of an AM or FM broadcast in accordance with the strength of the signals being received. The optimum tuning point is where the maximum number of indicators lights.

㊲ TAPE SWITCHES

TAPE 1:	Depress this switch to use the tape deck connected to the TAPE 1 jacks (REC and PLAY).
TAPE 2:	Depress this switch to use the second Tape deck connected to the TAPE 2 jacks (REC and PLAY).

NOTE:
Depress TAPE 1 and release TAPE 2 when dubbing a tape in the deck connected to the TAPE 1 jacks onto a tape in the deck connected to the TAPE 2 jacks.

㊳ MEMORY SWITCH

This switch is used to preset stations into the STATION CALL switches. It is also used when presetting the frequency response curves into the PRESET-TONE switches and the volume patterns into the PRESET-VOLUME switches.

㊴ ADAPTOR SWITCH

Depress this switch when reproducing sound from an adaptor component which is connected to the ADAPTOR jacks. Always release this switch if you are not using a component with these terminals.

㊵ TAPE COPY SWITCH (1 ⟷ 2)

This is used when dubbing or editing tapes using two tape decks connected to the TAPE 1 and TAPE 2 on the rear panel terminals. Depress when dubbing from the tape deck connected to the TAPE 1 (or TAPE 2) terminals to the tape deck connected to the TAPE 2 (or TAPE 1) terminals.

NOTE:
- *Make absolutely sure that the TAPE COPY switch is released if you do not intend to make use of the dubbing function. Otherwise you may not be able to record ordinary program source.*

㊶ SUBSONIC 15Hz SWITCH

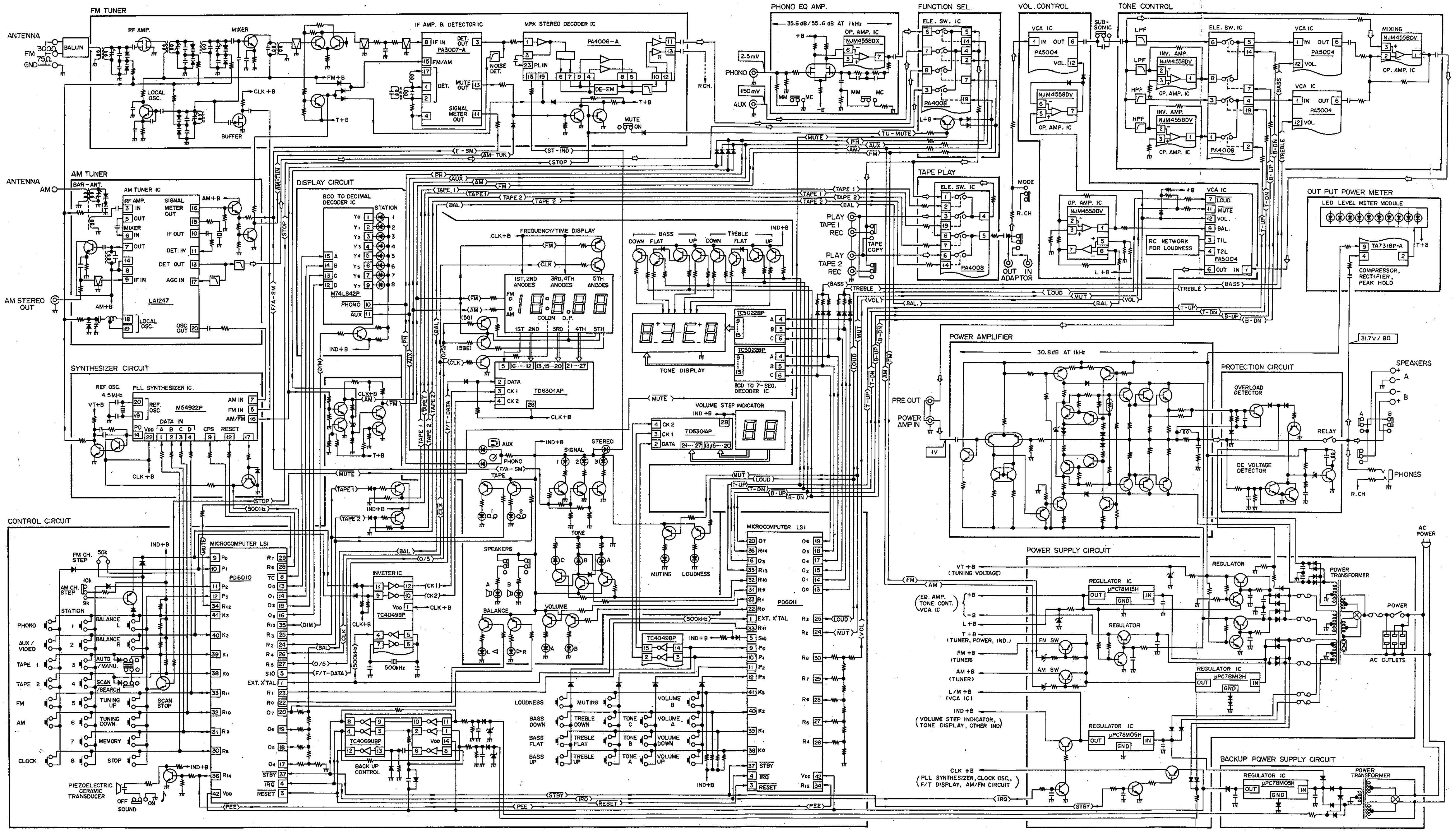
The subsonic filter with the 15Hz cut-off frequency is actuated when this switch is depressed. This filter serves to attenuate the frequencies lower than 15Hz with a 6dB/oct. slope and, therefore, it can be used to suppress the ultra-low-range noise which is generated by record warp and other factors. This noise cannot actually be heard by the ear but it can cause cross modulation distortion and even speaker damage. Use this switch when required during record play.

㊷ PHONO MM/MC SELECTOR

This selector can be set to the position corresponding to the type of cartridge which you are using for record play.

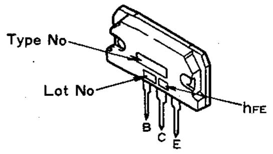
MM ▀	:	For moving magnet cartridges
MC ▄	:	For moving coil cartridges

3. BLOCK DIAGRAM


FM TUNER
ANTENNA
FM 300Ω 75Ω
GND
BALUN
RF AMP.
MIXER
LOCAL OSC.
BUFFER
CLK+B
IF AMP. & DETECTOR IC
PA3007-A
MPX STEREO DECODER IC
PA4006-A
NOISE DET.
DE-EM
MUTE
SIGNAL METER OUT
AM TUNER
ANTENNA AM
BAR-ANT.
AM TUNER IC
LA1247
AM STEREO OUT
SYNTHESIZER CIRCUIT
REF. OSC 4.5MHz
PLL SYNTHESIZER IC.
M54922P
DISPLAY CIRCUIT
BCD TO DECIMAL DECODER IC
M74LS42P
STATION
FREQUENCY/TIME DISPLAY
1ST, 2ND ANODES
3RD, 4TH ANODES
5TH ANODES
COLON D.P
TD6301AP
BASS
TREBLE
DOWN FLAT UP
TC5022BP
BCD TO 7-SEG. DECODER IC
TONE DISPLAY
VOLUME STEP INDICATOR
MUTING
LOUDNESS
SIGNAL
STEREO
TAPE
AUX
PHONO
TONE
SPEAKERS
BALANCE
VOLUME
PHONO EQ AMP.
35.6dB/55.6dB AT 1kHz
OP. AMP. IC
NJM4558DX
2.5mV
150mV
MM MC
FUNCTION SEL.
ELE. SW. IC
PA4008
VOL. CONTROL
VCA IC
PA5004
NJM4558DV
SUB-SONIC
TONE CONTROL
LPF
HPF
INV. AMP.
MIXING
TAPE PLAY
PLAY TAPE 1 REC
PLAY TAPE 2 REC
TAPE COPY
MODE
R.CH
OUT IN ADAPTOR
RC NETWORK FOR LOUDNESS
OUT PUT POWER METER
LED LEVEL METER MODULE
TA7318P-A
COMPRESSOR, RECTIFIER, PEAK HOLD
POWER AMPLIFIER
30.8dB AT 1kHz
31.7V/8Ω
PRE OUT
POWER AMP IN
PROTECTION CIRCUIT
OVERLOAD DETECTOR
DC VOLTAGE DETECTOR
RELAY
SPEAKERS A B
PHONES
CONTROL CIRCUIT
MICROCOMPUTER LSI
PD6010
PD6011
FM CH. STEP
AM CH STEP
PHONO
AUX/VIDEO
TAPE 1
TAPE 2
FM
AM
CLOCK
BALANCE L
BALANCE R
AUTO/MANU.
SCAN/SEARCH
TUNING UP
TUNING DOWN
MEMORY
STOP
SCAN STOP
PIEZOELECTRIC CERAMIC TRANSDUCER
OFF SOUND ON
INVETER IC
TC4049BP
500kHz
TC4069UBP
BACK UP CONTROL
BASS DOWN
BASS FLAT
BASS UP
TREBLE DOWN
TREBLE FLAT
TREBLE UP
TONE C
TONE B
TONE A
VOLUME B
VOLUME A
VOLUME DOWN
VOLUME UP
POWER SUPPLY CIRCUIT
VT+B (TUNING VOLTAGE)
(EQ. AMP. TONE CONT. VCA IC)
L+B
T+B (TUNER, POWER, IND.)
FM+B (TUNER)
AM+B (TUNER)
L/M+B (VCA IC)
IND+B (VOLUME STEP INDICATOR, TONE DISPLAY, OTHER IND)
CLK+B (PLL SYNTHESIZER, CLOCK OSC., F/T DISPLAY, AM/FM CIRCUIT)
REGULATOR IC
μPC78M15H
μPC78M12H
μPC78M05H
REGULATOR
FM SW
AM SW
POWER TRANSFORMER
AC POWER
POWER
AC OUTLETS
BACKUP POWER SUPPLY CIRCUIT

External Appearance of Transistors and ICs

2SA1076
2SC2526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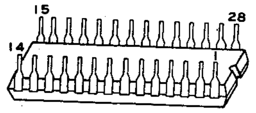

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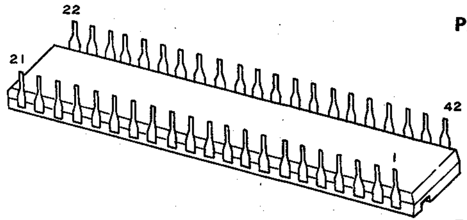
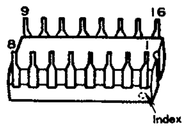
PD6011



TC4049BP
TC5022BP
M74LS42P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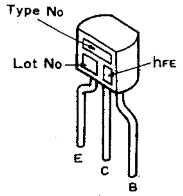
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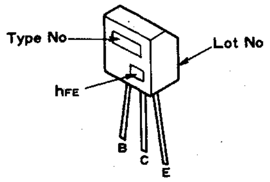
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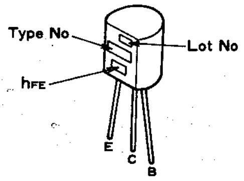
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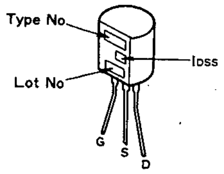
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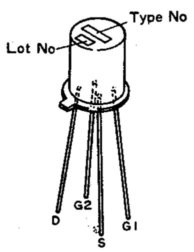
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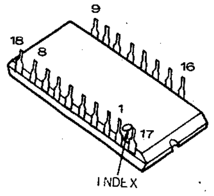
S
G1

PA3007-A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16
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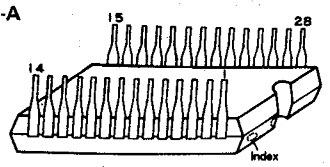
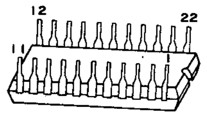
17
INDEX

PA4006-A


15
28
14
Index

M54922P



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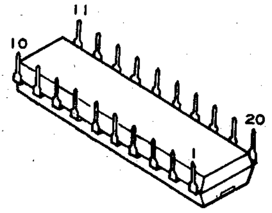

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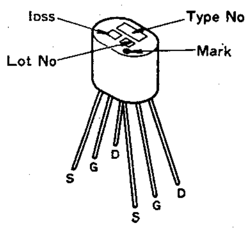
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Type No
Lot No
Mark
S
G
D
S
G
D

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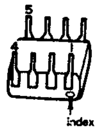
NJM4558DV
μPC4558C-P



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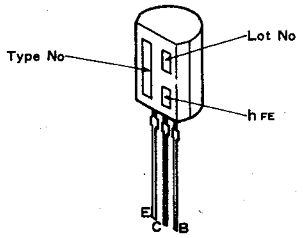
Type No
Lot No
h FE
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C
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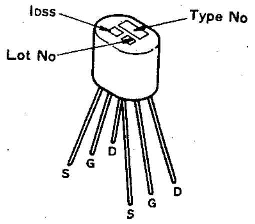
Ioss
Type No
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S
G
D
S
G
D

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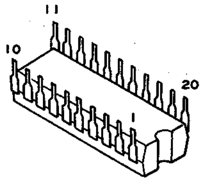

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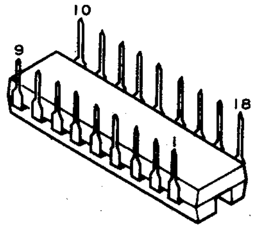
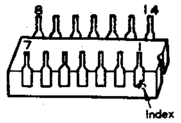
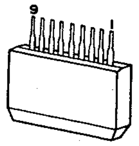


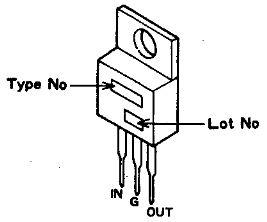
TC4069UBP


8
14
7
1
Index

TA7318P



μPC78M05H
μPC78M12H
μPC78M15H


Type No
Lot No
IN
G
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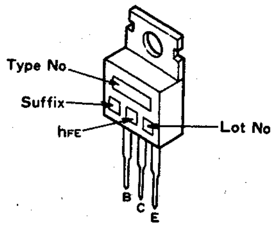
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B
C
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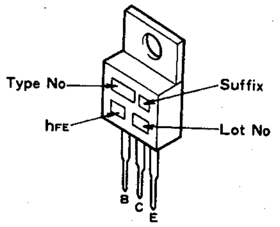
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B
C
E

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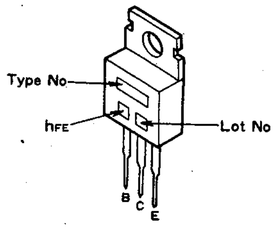
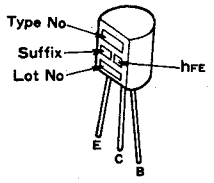

Type No
hFE
Lot No
B
C
E

2SC1775A
2SC1890A


Type No
Suffix
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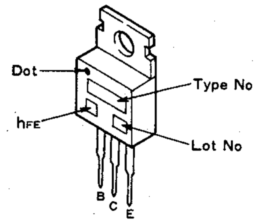
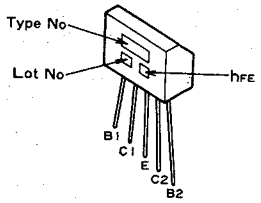
hFE
E
C
B

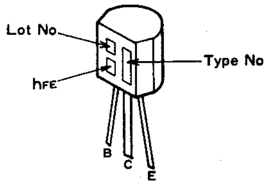
2SD313P


Dot
Type No
hFE
Lot No
B
C
E

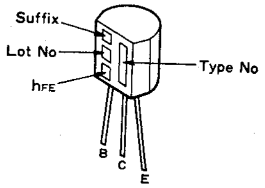
2SA979


Type No
Lot No
hFE
B1
C1
E
C2
B2

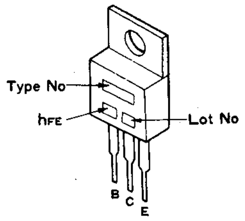
2SA905
2SC1915


Lot No
hFE
Type No
B
C
E

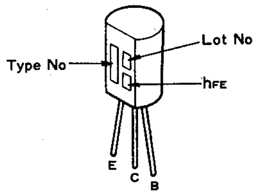
2SA904A
2SC1914A


Suffix
Lot No
hFE
Type No
B
C
E

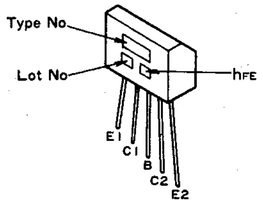
2SA985A
2SC2275A


Type No
hFE
Lot No
B
C
E

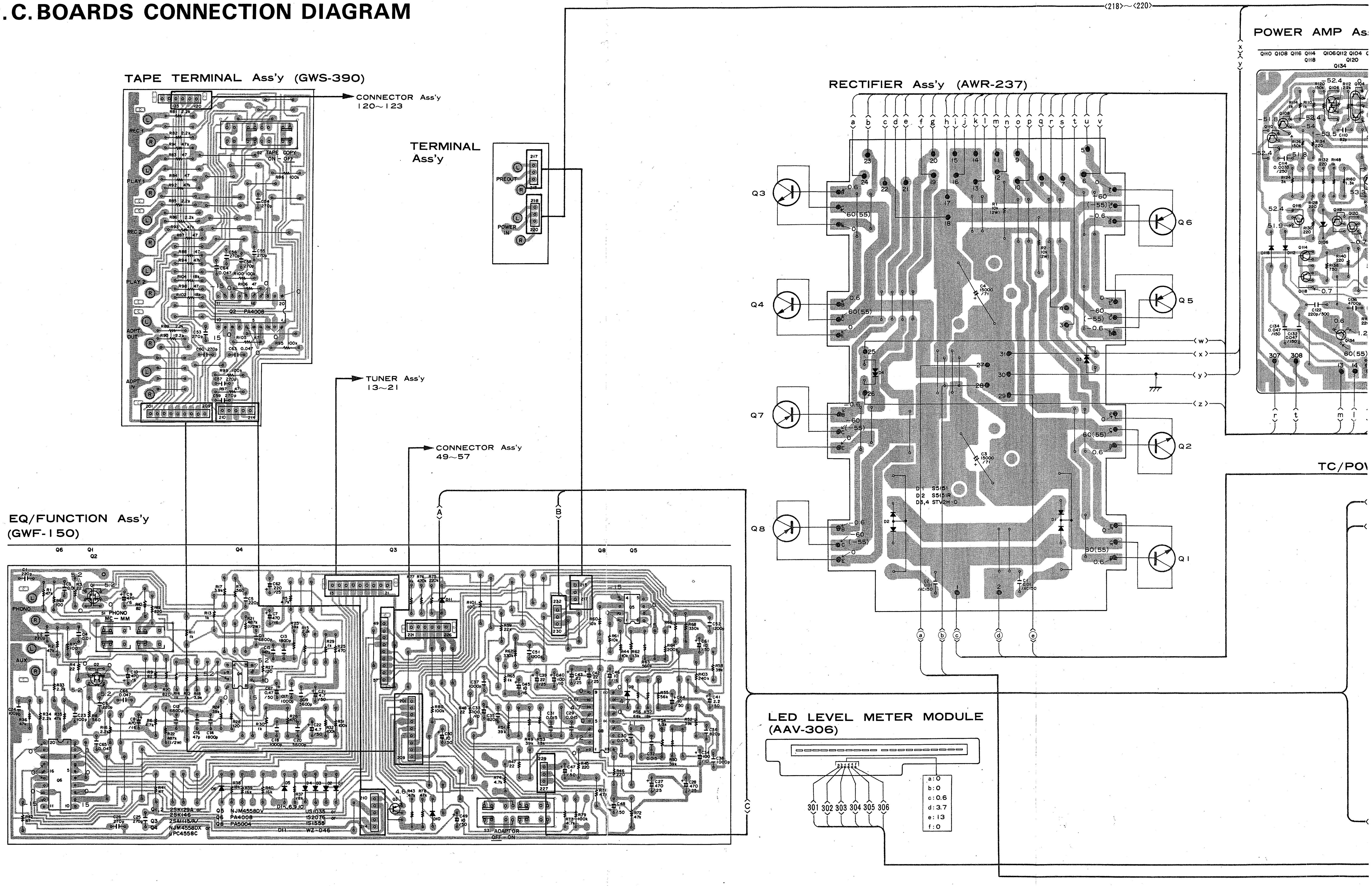
2SA992

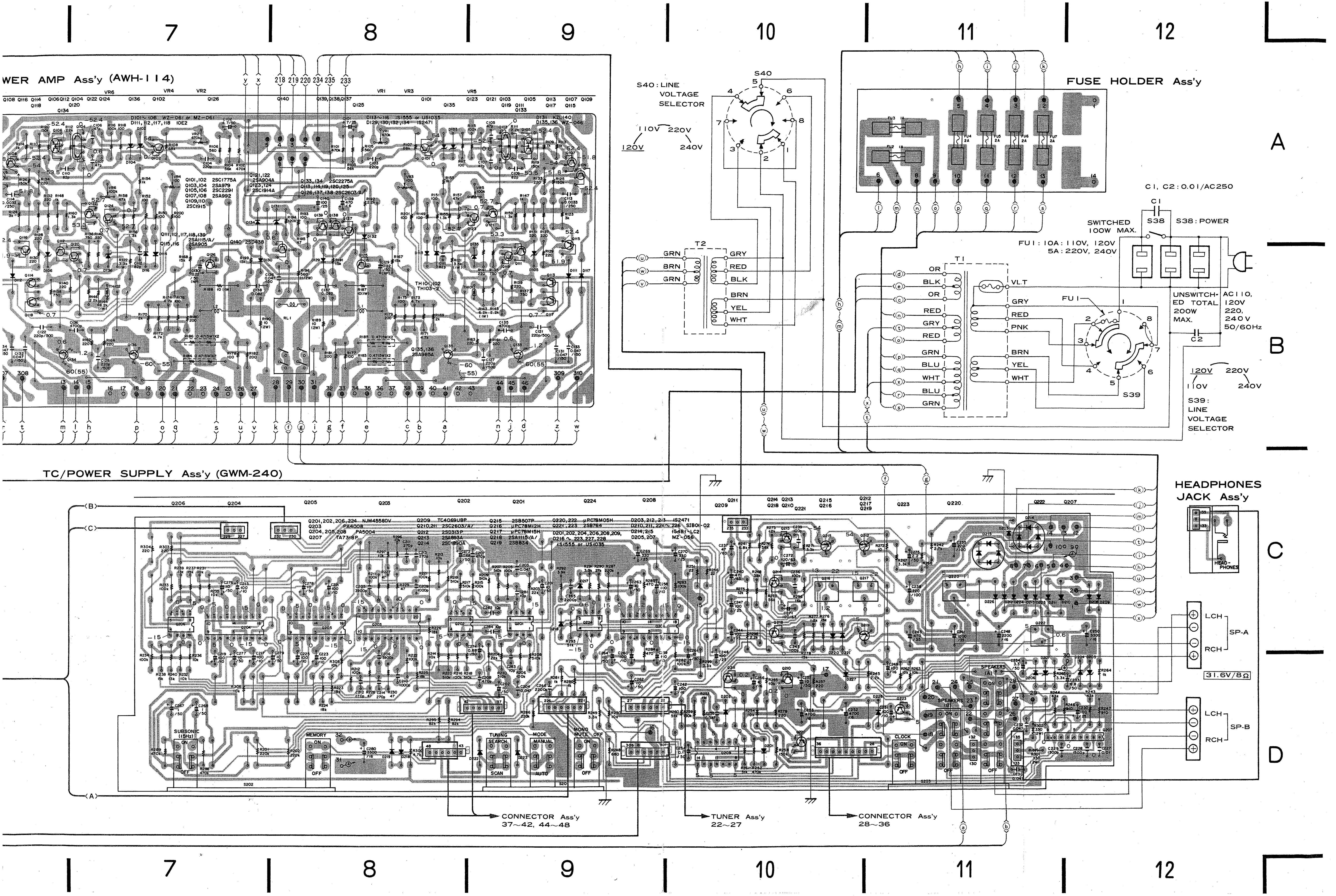

Type No
Lot No
hFE
E
C
B

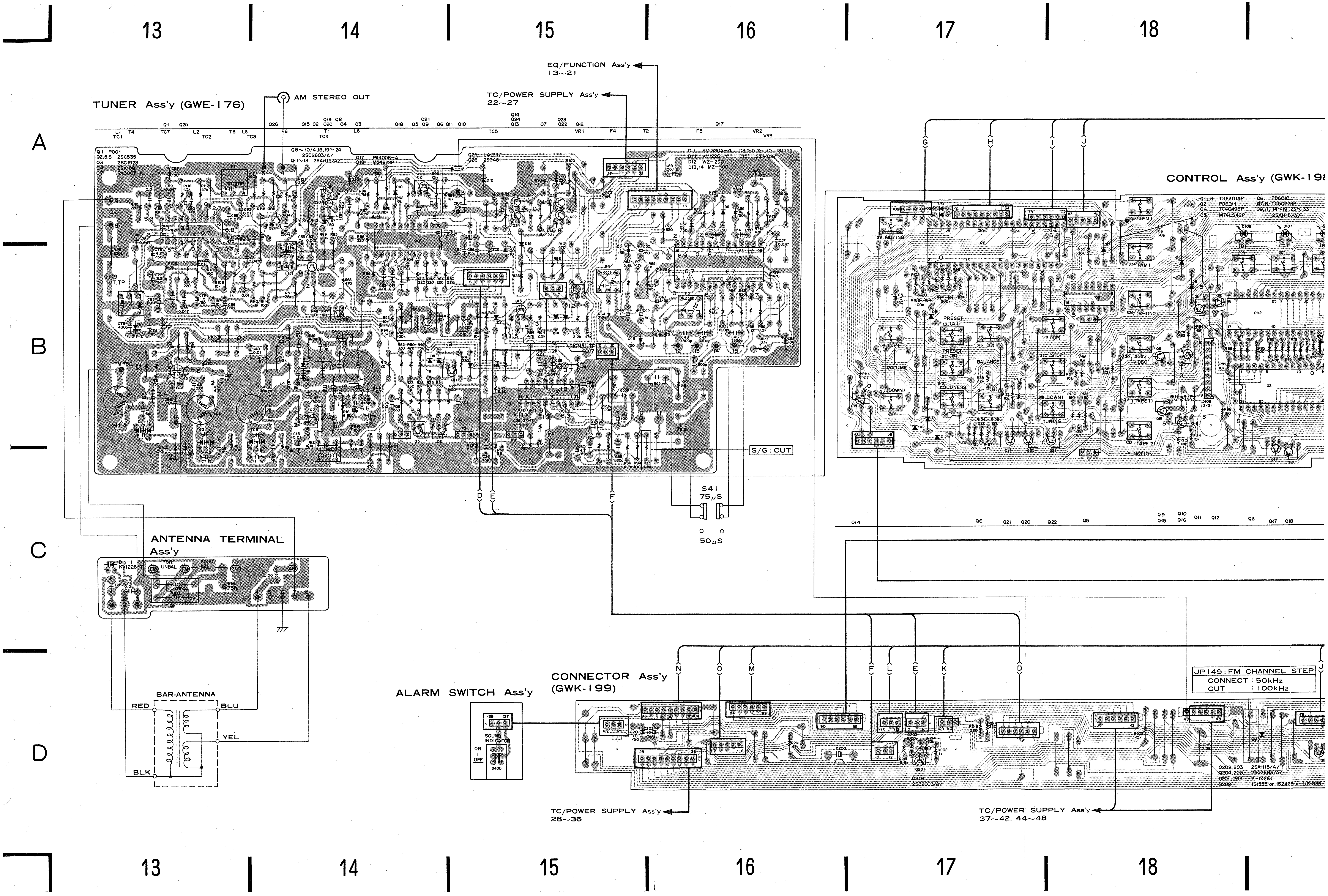
2SC2291

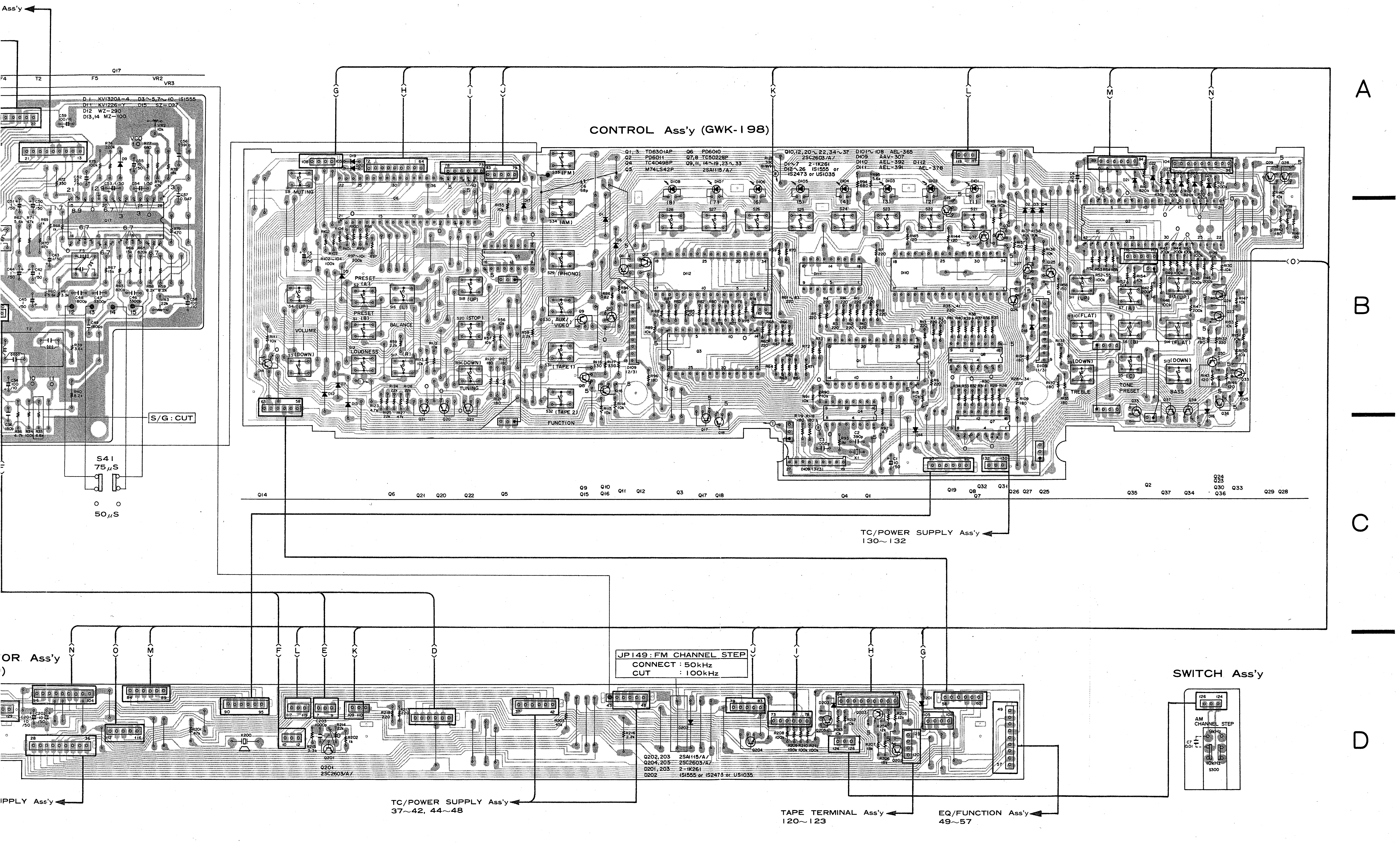

Type No
Lot No
hFE
E1
C1
B
C2
E2

4. P.C. BOARDS CONNECTION DIAGRAM

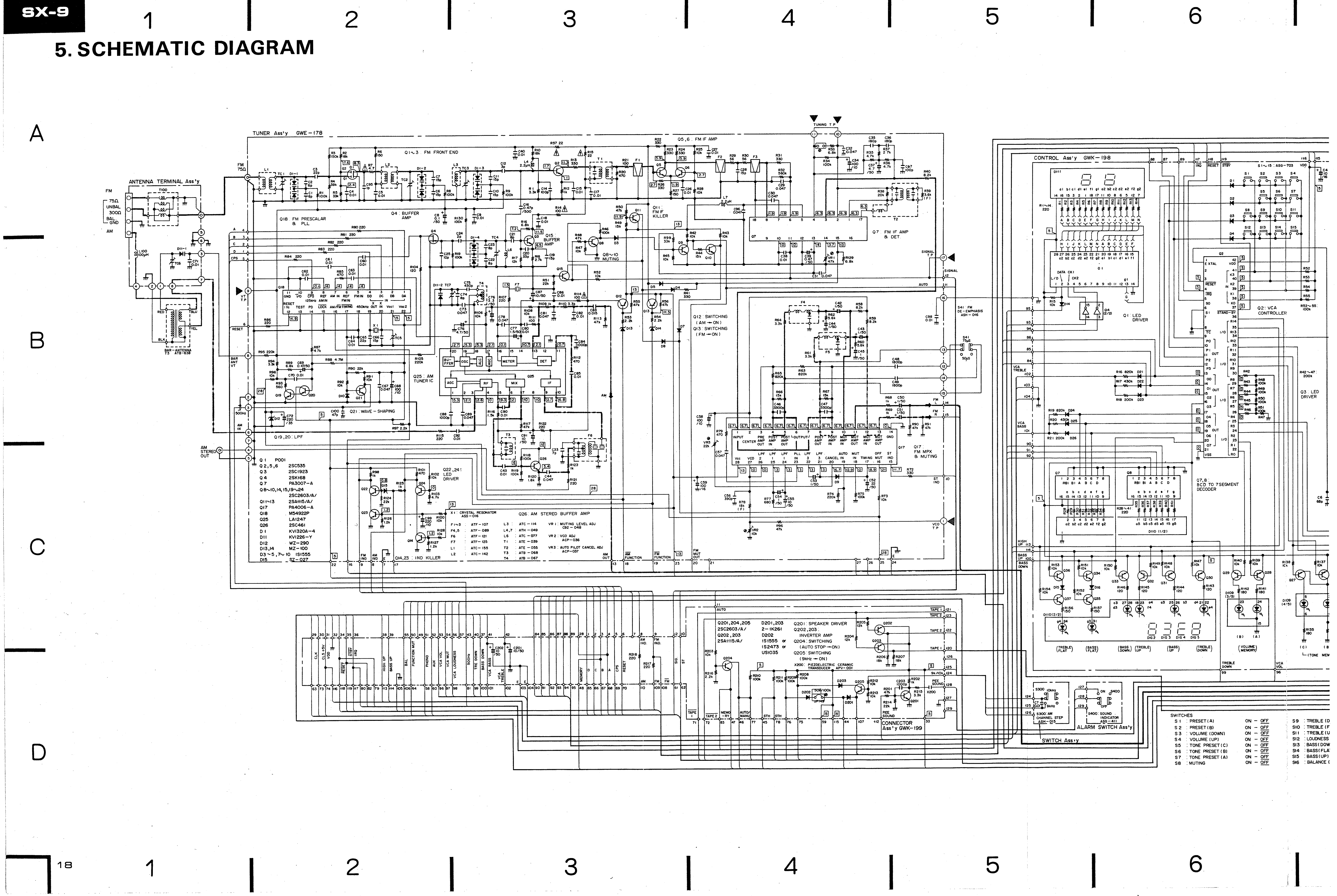

1
2
3
4
5
6
A
B
C
D
TAPE TERMINAL Ass'y (GWS-390)
CONNECTOR Ass'y 120~123
TAPE COPY ON - OFF
REC 1
PLAY 1
REC 2
PLAY 2
ADPT OUT
ADPT IN
Q2 PA4008
TERMINAL Ass'y
PREOUT
POWER IN
<218>~<220>
TUNER Ass'y 13~21
CONNECTOR Ass'y 49~57
RECTIFIER Ass'y (AWR-237)
a b c d e f g h i j k l m n o p q r s t u v
Q3
Q4
Q7
Q8
Q6
Q5
Q2
Q1
w
x
y
z
D1 S5151
D2 S5151R
D3,4 STV2H-0
POWER AMP As
TC/POV
EQ/FUNCTION Ass'y (GWF-150)
PHONO
AUX
S1 PHONO MC - MM
S3 ADAPTOR OFF - ON
Q1, 2 2SK129A or 2SK146
Q3 2SA1115(A)
Q4
Q5 NJM4558DV
Q6 PA4008
Q8 PA5004
NJM4558DV or μPC4558C
D1~6, 9, 10 US1035 or 1S2076 or 1S1555
D11 WZ-046
A
B
C
LED LEVEL METER MODULE (AAV-306)
301 302 303 304 305 306
a: 0
b: 0
c: 0.6
d: 3.7
e: 13
f: 0


7
8
9
10
11
12
A
B
C
D
WER AMP Ass'y (AWH-114)
S40: LINE VOLTAGE SELECTOR
110V 220V
120V 240V
T2
GRN
BRN
GRN
GRY
RED
BLK
BRN
YEL
WHT
FUSE HOLDER Ass'y
C1, C2: 0.01/AC250
C1
S38
S38: POWER
SWITCHED 100W MAX.
FU1: 10A: 110V, 120V
5A: 220V, 240V
T1
OR
BLK
OR
RED
GRY
RED
GRN
BLU
WHT
BLU
GRN
VLT
GRY
RED
PNK
BRN
YEL
WHT
FU1
UNSWITCHED TOTAL 200W MAX.
AC110, 120V 220, 240V 50/60Hz
C2
120V 220V
110V 240V
S39
S39: LINE VOLTAGE SELECTOR
TC/POWER SUPPLY Ass'y (GWM-240)
HEADPHONES JACK Ass'y
HEAD-PHONES
LCH
RCH
SP-A
31.6V/8Ω
SP-B
SUBSONIC (15Hz)
MEMORY
TUNING SEARCH SCAN
MODE MANUAL AUTO
MONO MUTE OFF
CLOCK
SPEAKERS (A)
SPEAKERS (B)
CONNECTOR Ass'y 37~42, 44~48
TUNER Ass'y 22~27
CONNECTOR Ass'y 28~36
Q201, 202, 206, 224 NJM4558DV
Q203 PA4008
Q204, 205, 208 PA5004
Q207 TA7318P
Q209 TC4069UBP
Q210, 211 2SC2603/A/
Q212 2SD313P
Q213 2SA893A
Q214 2SA1090A
Q215 2SB507P
Q216 μPC78M12H
Q217 μPC78M15H
Q218 2SA1115/A/
Q219 2SB834
Q220, 222 μPC78M05H
Q221, 223 2SB765
D201, 202, 204, 206, 208, 209, D216 ~ 223, 227, 228 1S1555 or US1035
D203, 212, 213 1S2471
D210, 211, 224 ~ 226 S1B01-02
D214, 215 (G4B1-LC2)
D205, 207 MZ-056
Q101, 102 2SC1775A
Q103, 104 2SA979
Q105, 106 2SC2291
Q107, 108 2SA992
Q109, 110 2SC1915
Q111, 112, 117, 118, 139 2SA1115/A/
Q115, 116 2SA905
Q121, 122 2SA904A
Q123, 124 2SC1914A
Q133, 134 2SC2275A
Q113, 114, 119, 120, 125 2SC2603/A/
Q126, 137, 138
Q140 2SD438
Q135, 136 2SA985A
D101 ~ 106 WZ-061 or MZ-061
D111, 112, 117, 118 10E2
D113 ~ 116 1S1555 or US1035
D129, 130, 132, 134 1S2471
D131 KZL140
D135, 136 WZ-046
TH101, 102 TH103-2
RL1

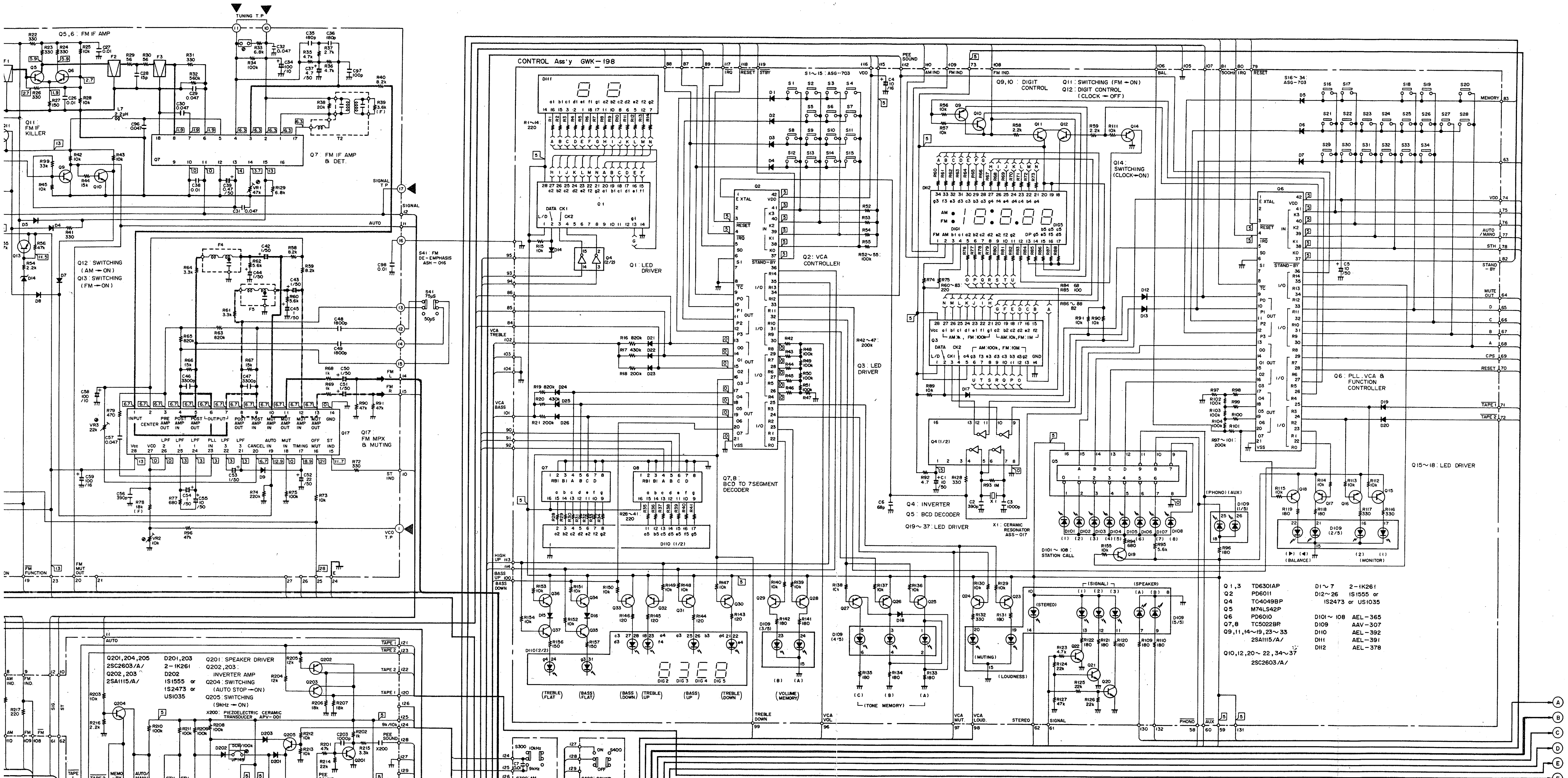

13
14
15
16
17
18
A
B
C
D
TUNER Ass'y (GWE-176)
AM STEREO OUT
EQ/FUNCTION Ass'y
13~21
TC/POWER SUPPLY Ass'y
22~27
Q1 P001
Q2,5,6 2SC535
Q3 2SC1923
Q4 2SK168
Q7 PA3007-A
Q8~10,14,15,19~24 2SC2603/A/
Q11~13 2SA1115/A/
Q17 PA4006-A
Q18 M54922P
Q25 LA1247
Q26 2SC461
D1 KV1320A-4
D11 KV1226-Y
D12 WZ-290
D13,14 MZ-100
D3~5,7~10 1S1555
D15 SZ-027
VCO
SIGNAL TP
VT.TP
FM 75Ω
S/G: CUT
S41
75µS
50µS
CONTROL Ass'y (GWK-198
Q1, 3 TD6301AP
Q2 PD6011
Q4 TC4049BP
Q5 M74LS42P
Q6 PD6010
Q7,8 TC5022BP
Q9, 11, 14~19, 23~33 2SA1115/A/
MUTING
VOLUME
PRESET (A)
PRESET (B)
BALANCE
LOUDNESS
TUNING
FUNCTION
S33 (FM)
S34 (AM)
S29 (PHONO)
S30 AUX/VIDEO
S31 (TAPE 1)
S32 (TAPE 2)
ANTENNA TERMINAL Ass'y
D11-1 KV1226-Y
75Ω UNBAL
300Ω BAL
FM 75Ω
BAR-ANTENNA
RED
BLU
YEL
BLK
ALARM SWITCH Ass'y
SOUND INDICATOR
ON
OFF
S400
CONNECTOR Ass'y (GWK-199)
JP149: FM CHANNEL STEP
CONNECT : 50kHz
CUT : 100kHz
Q201 2SC2603/A/
Q202,203 2SA1115/A/
Q204,205 2SC2603/A/
D201,203 2-1K261
D202 1S1555 or 1S2473 or US1035
TC/POWER SUPPLY Ass'y
28~36
TC/POWER SUPPLY Ass'y
37~42, 44~48


CONTROL Ass'y (GWK-198)
Ass'y
Q1, 3 TD6301AP
Q2 PD6011
Q4 TC4049BP
Q5 M74LS42P
Q6 PD6010
Q7, 8 TC5022BP
Q9, 11, 14~19, 23~33 2SA1115/A/
Q10, 12, 20~22, 34~37 2SC2603/A/
D1~7 2-1K261
D12~26 1S1555 or 1S2473 or US1035
D101~108 AEL-365
D109 AAV-307
D110 AEL-392
D111 AEL-391
D112 AEL-378
D1 KV1320A-4
D3~5, 7~10 1S1555
D11 KV1226-Y
D15 SZ-D27
D12 WZ-290
D13, 14 MZ-100
VCO
S8 MUTING
S33 (FM)
S34 (AM)
S29 (PHONO)
S30 AUX/VIDEO
S31 (TAPE 1)
S32 (TAPE 2)
FUNCTION
VOLUME
S4 (UP)
S3 (DOWN)
PRESET (A)
PRESET (B)
LOUDNESS
BALANCE
S18 (UP)
S20 (STOP)
S19 (DOWN)
TUNING
S11 (UP)
S10 (FLAT)
S9 (DOWN)
TREBLE
TONE PRESET
S13 (UP)
S14 (FLAT)
S13 (DOWN)
BASS
S/G : CUT
S41
75µS
50µS
TC/POWER SUPPLY Ass'y
130~132
OR Ass'y
JP149 : FM CHANNEL STEP
CONNECT : 50kHz
CUT : 100kHz
Q202, 203 2SA1115/A/
Q204, 205 2SC2603/A/
D201, 203 2-1K261
D202 1S1555 or 1S2473 or US1035
Q201
2SC2603/A/
UPPLY Ass'y
TC/POWER SUPPLY Ass'y
37~42, 44~48
TAPE TERMINAL Ass'y
120~123
EQ/FUNCTION Ass'y
49~57
SWITCH Ass'y
AM CHANNEL STEP
9kHz
10kHz
S300
A
B
C
D

5. SCHEMATIC DIAGRAM


1
2
3
4
5
6
A
B
C
D
TUNER Ass'y GWE-178
ANTENNA TERMINAL Ass'y
FM 75Ω UNBAL 300Ω BAL GND AM
BAR-ANTENNA T3 ATB-638
Q1~3 : FM FRONT END
Q4 : BUFFER AMP
Q5,6 : FM IF AMP
TUNING T.P
Q7 FM IF AMP & DET
Q11 FM IF KILLER
Q8~10 MUTING
Q15 BUFFER AMP
Q18 FM PRESCALAR & PLL
Q25 : AM TUNER IC
Q21 : WAVE-SHAPING
Q19,20 : LPF
Q12 : SWITCHING (AM→ON)
Q13 : SWITCHING (FM→ON)
Q17 FM MPX & MUTING
S41 FM DE-EMPHASIS ASH-016
SIGNAL T.P
VCO T.P
Q22,24 : LED DRIVER
Q14,23 : IND KILLER
Q26 : AM STEREO BUFFER AMP
Q1 P001
Q2,5,6 2SC535
Q3 2SC1923
Q4 2SK168
Q7 PA3007-A
Q8~10,14,15,19~24 2SC2603/A/
Q11~13 2SA1115/A/
Q17 PA4006-A
Q18 M54922P
Q25 LA1247
Q26 2SC461
D1 KV1320A-4
D11 KV1226-Y
D12 WZ-290
D13,14 MZ-100
D3~5,7~10 1S1555
D15 SZ-027
X1 : CRYSTAL RESONATOR ASS-016
F1~3 : ATF-107
F4,5 : ATF-089
F6 : ATF-121
F7 : ATF-125
L1 : ATC-155
L2 : ATC-142
L3 : ATC-114
L4,7 : ATH-049
L6 : ATC-077
T1 : ATE-039
T2 : ATE-055
T3 : ATB-068
T4 : ATB-067
VR1 : MUTING LEVEL ADJ C92-048
VR2 : VCO ADJ ACP-036
VR3 : AUTO PILOT CANCEL ADJ ACP-037
CONTROL Ass'y GWK-198
Q1 LED DRIVER
Q2 : VCA CONTROLLER
Q3 LED DRIVER
Q7,8 : BCD TO 7SEGMENT DECODER
S1~15 : ASG-703
Q201,204,205 2SC2603/A/
Q202,203 2SA1115/A/
D201,203 2-1K261
D202 1S1555 or 1S2473 or US1035
Q201 : SPEAKER DRIVER
Q202,203 : INVERTER AMP
Q204 : SWITCHING (AUTO STOP→ON)
Q205 : SWITCHING (9kHz→ON)
X200 : PIEZOELECTRIC CERAMIC TRANSDUCER APV-001
CONNECTOR Ass'y GWK-199
S300 : AM CHANNEL STEP ASH-015
S400 : SOUND INDICATOR ASG-411
ALARM SWITCH Ass'y
SWITCH Ass'y
SWITCHES
S1 : PRESET (A) ON - OFF
S2 : PRESET (B) ON - OFF
S3 : VOLUME (DOWN) ON - OFF
S4 : VOLUME (UP) ON - OFF
S5 : TONE PRESET (C) ON - OFF
S6 : TONE PRESET (B) ON - OFF
S7 : TONE PRESET (A) ON - OFF
S8 : MUTING ON - OFF
S9 : TREBLE (D
S10 : TREBLE (F
S11 : TREBLE (U
S12 : LOUDNESS
S13 : BASS (DOW
S14 : BASS (FLA
S15 : BASS (UP)
S16 : BALANCE (
(TREBLE FLAT)
(BASS FLAT)
(BASS DOWN)
(TREBLE UP)
(BASS UP)
(TREBLE DOWN)
(VOLUME MEMORY)
(TONE MEM

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

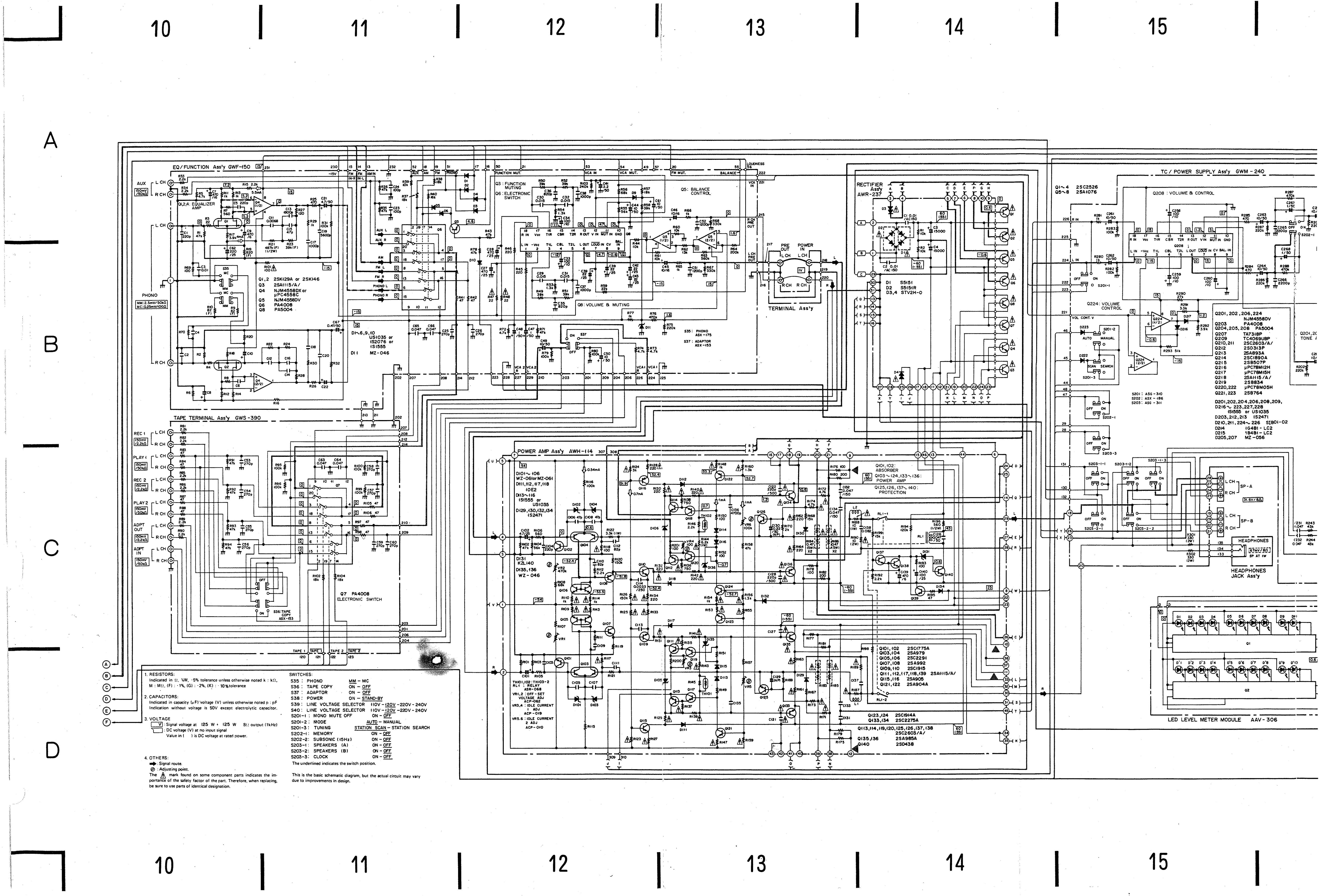

TUNING T.P
Q5,6 : FM IF AMP
Q7 FM IF AMP & DET.
Q11 FM IF KILLER
Q12 SWITCHING (AM→ON)
Q13 SWITCHING (FM→ON)
SIGNAL T.P
S41 FM DE-EMPHASIS ASH-016
Q17 FM MPX & MUTING
VCO T.P
CONTROL Ass'y GWK-198
Q1 LED DRIVER
Q2 VCA CONTROLLER
S1~15 : ASG-703
Q3 LED DRIVER
Q7,8 BCD TO 7SEGMENT DECODER
Q9,10 : DIGIT CONTROL
Q11 : SWITCHING (FM→ON)
Q12 : DIGIT CONTROL (CLOCK→OFF)
Q14 SWITCHING (CLOCK→ON)
Q4 : INVERTER
Q5 : BCD DECODER
Q19~37 : LED DRIVER
X1 : CERAMIC RESONATOR ASS-017
D101~108 : STATION CALL
S16~34 : ASG-703
Q6 : PLL, VCA & FUNCTION CONTROLLER
Q15~18 : LED DRIVER
(BALANCE)
(MONITOR)
(TREBLE FLAT)
(BASS FLAT)
(VOLUME MEMORY)
(TONE MEMORY)
(LOUDNESS)
(MUTING)
(STEREO)
(SIGNAL)
(SPEAKER)
Q201,204,205 2SC2603/A/
Q202,203 2SA1115/A/
D201,203 2-1K261
D202 1S1555 or 1S2473 or US1035
Q201 : SPEAKER DRIVER
Q202,203 : INVERTER AMP
Q204 : SWITCHING (AUTO STOP→ON)
Q205 : SWITCHING (9kHz→ON)
X200 : PIEZOELECTRIC CERAMIC TRANSDUCER APV-001
CONNECTOR Ass'y GWK-199
S300 : AM CHANNEL STEP ASH-015
S400 : SOUND INDICATOR ASG-411
SWITCH Ass'y
ALARM SWITCH Ass'y

Q1,3	TD6301AP	D1~7	2-1K261
Q2	PD6011	D12~26	1S1555 or 1S2473 or US1035
Q4	TC4049BP		
Q5	M74LS42P	D101~108	AEL-365
Q6	PD6010	D109	AAV-307
Q7,8	TC5022BP	D110	AEL-392
Q9,11,14~19,23~33	2SA1115/A/	D111	AEL-391
Q10,12,20~22,34~37	2SC2603/A/	D112	AEL-378

SWITCHES

S1	PRESET (A)	ON – OFF
S2	PRESET (B)	ON – OFF
S3	VOLUME (DOWN)	ON – OFF
S4	VOLUME (UP)	ON – OFF
S5	TONE PRESET (C)	ON – OFF
S6	TONE PRESET (B)	ON – OFF
S7	TONE PRESET (A)	ON – OFF
S8	MUTING	ON – OFF
S9	TREBLE (DOWN)	ON – OFF
S10	TREBLE (FLAT)	ON – OFF
S11	TREBLE (UP)	ON – OFF
S12	LOUDNESS	ON – OFF
S13	BASS (DOWN)	ON – OFF
S14	BASS (FLAT)	ON – OFF
S15	BASS (UP)	ON – OFF
S16	BALANCE (L)	ON – OFF
S17	BALANCE (R)	ON – OFF
S18	TUNING (UP)	ON – OFF
S19	TUNING (DOWN)	ON – OFF
S20	TUNING (STOP)	ON – OFF
S21	STATION CALL (1)	ON – OFF
S22	STATION CALL (2)	ON – OFF
S23	STATION CALL (3)	ON – OFF
S24	STATION CALL (4)	ON – OFF
S25	STATION CALL (5)	ON – OFF
S26	STATION CALL (6)	ON – OFF
S27	STATION CALL (7)	ON – OFF
S28	STATION CALL (8)	ON – OFF
S29	FUNCTION (PHONO)	ON – OFF
S30	FUNCTION (AUX / VIDEO)	ON – OFF
S31	FUNCTION (TAPE 1)	ON – OFF
S32	FUNCTION (TAPE 2)	ON – OFF
S33	FUNCTION (FM)	ON – OFF
S34	FUNCTION (AM)	ON – OFF
S41	FM DE-EMPHASIS	50μS – 75μS
S300	AM CHANNEL STEP	9kHz – 10kHz
S400	SOUND INDICATOR	ON – OFF

The underlined indicates the switch position.


10
11
12
13
14
15
A
B
C
D
EQ/FUNCTION Ass'y GWF-150
Q1,2,4: EQUALIZER AMP
AUX
PHONO
MM:2.5mV/50kΩ
MC:0.25mV/100Ω
S35 MC MM
Q1,2 2SK129A or 2SK146
Q3 2SA1115/A/
Q4 NJM4558DX or μPC4558C
Q5 NJM4558DV
Q6 PA4008
Q8 PA5004
D1~6,9,10 US1035 or 1S2076 or 1S1555
D11 MZ-046
Q3: FUNCTION MUTING
Q6: ELECTRONIC SWITCH
Q5: BALANCE CONTROL
Q8: VOLUME & MUTING
AUX L
AUX R
AM
FM L
FM R
PHONO L
PHONO R
FUNCTION MUT.
VCA IN
VCA MUT.
FM MUT.
BALANCE
LOUDNESS
L CH PRE OUT
R CH PRE OUT
PRE OUT
POWER IN
TERMINAL Ass'y
S35: PHONO ASX-175
S37: ADAPTOR ASX-153
TAPE TERMINAL Ass'y GWS-390
REC 1
PLAY 1
REC 2
PLAY 2
ADPT OUT
ADPT IN
L CH
R CH
Q7 PA4008 ELECTRONIC SWITCH
S36: TAPE COPY ASX-153
TAPE 1
TAPE 2
RECTIFIER Ass'y AWR-237
D1 S5151
D2 S5151R
D3,4 STV2H-0
POWER AMP Ass'y AWH-114
D101~106 WZ-061 or MZ-061
D111,112,117,118 10E2
D113~116 1S1555 or US1035
D129,130,132,134 1S2471
D131 KZL140
D135,136 WZ-046
TH101,102: TH103-2
RL1: RELAY ASR-068
VR1,2: OFF-SET VOLTAGE ADJ ACP-062
VR3,4: IDLE CURRENT 1 ADJ ACP-019
VR5.6: IDLE CURRENT 2 ADJ ACP-010
Q101,102: ABSORBER
Q103~124,133~136: POWER AMP
Q125,126,137~140: PROTECTION
Q101,102 2SC1775A
Q103,104 2SA979
Q105,106 2SC2291
Q107,108 2SA992
Q109,110 2SC1915
Q111,112,117,118,139 2SA1115/A/
Q115,116 2SA905
Q121,122 2SA904A
Q123,124 2SC1914A
Q133,134 2SC2275A
Q113,114,119,120,125,126,137,138 2SC2603/A/
Q135,136 2SA985A
Q140 2SD438
TC/POWER SUPPLY Ass'y GWM-240
Q1~4 2SC2526
Q5~8 2SA1076
Q208: VOLUME & CONTROL
Q224: VOLUME CONTROL
VOL CONT. V
AUTO
MANUAL
SCAN
SEARCH
S201: ASG-340
S202: ASX-186
S203: ASG-311
Q201,202,206,224 NJM4558DV
Q203 PA4008
Q204,205,208 PA5004
Q207 TA7318P
Q209 TC4069UBP
Q210,211 2SC2603/A/
Q212 2SD313P
Q213 2SA893A
Q214 2SC1890A
Q215 2SB507P
Q216 μPC78M12H
Q217 μPC78M15H
Q218 2SA1115/A/
Q219 2SB834
Q220,222 μPC78M05H
Q221,223 2SB764
D201,202,204,206,208,209, D216~223,227,228 1S1555 or US1035
D203,212,213 1S2471
D210,211,224~226 SIB01-02
D214 1G4B1-LC2
D215 1B4B1-LC2
D205,207 MZ-056
SP-A
SP-B
HEADPHONES
HEADPHONES JACK Ass'y
LED LEVEL METER MODULE AAV-306

1. RESISTORS:
Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

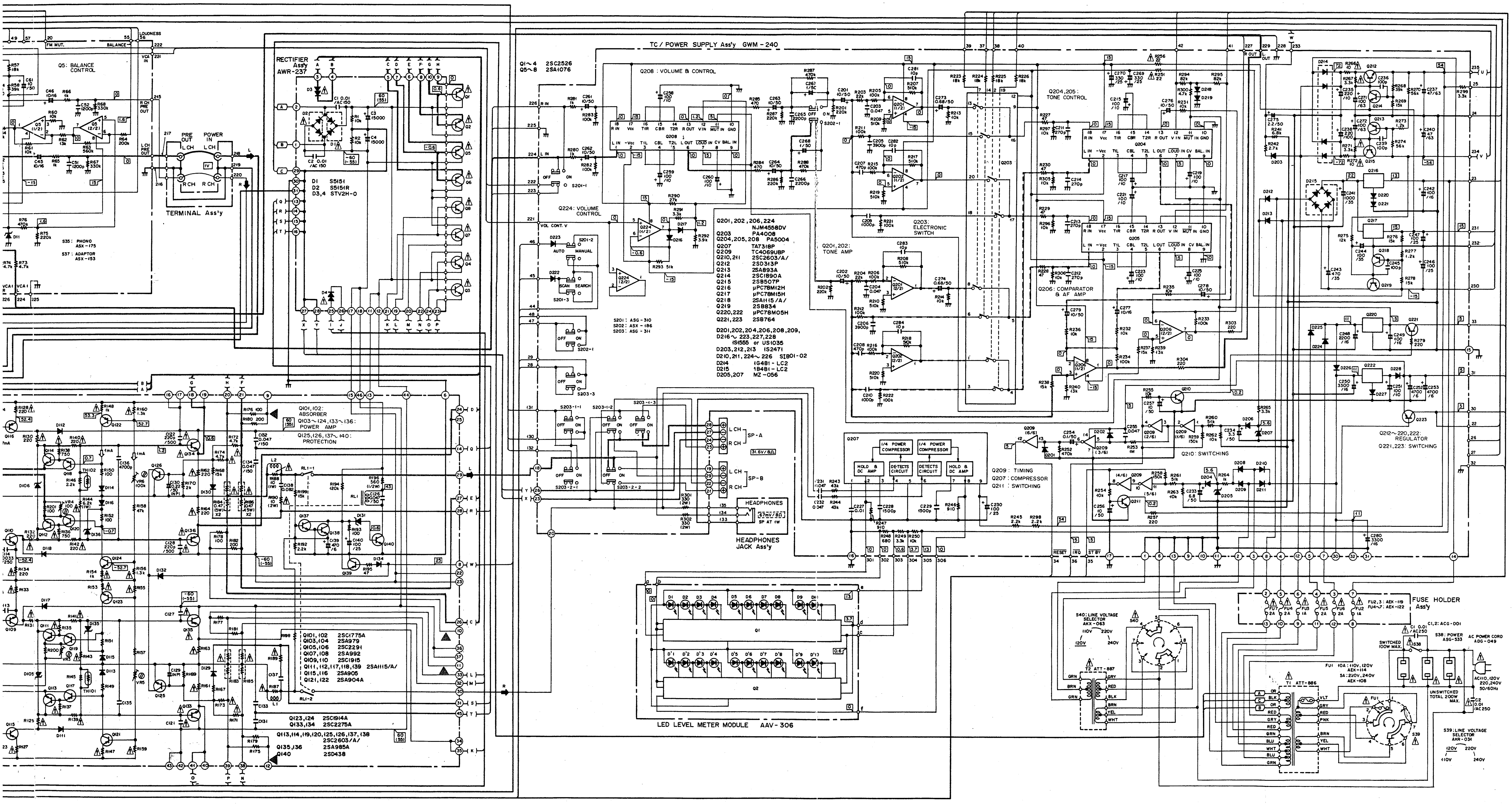
3. VOLTAGE
V : Signal voltage at 125 W + 125 W 8Ω output (1kHz)
: DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.

4. OTHERS:
➡ : Signal route.
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

SWITCHES:
S35 : PHONO MM – MC
S36 : TAPE COPY ON – OFF
S37 : ADAPTOR ON – OFF
S38 : POWER ON – STAND-BY
S39 : LINE VOLTAGE SELECTOR 110V – 120V – 220V – 240V
S40 : LINE VOLTAGE SELECTOR 110V – 120V – 220V – 240V
S201-1 : MONO MUTE OFF ON – OFF
S201-2 : MODE AUTO – MANUAL
S201-3 : TUNING STATION SCAN – STATION SEARCH
S202-1 : MEMORY ON – OFF
S202-2 : SUBSONIC (15Hz) ON – OFF
S203-1 : SPEAKERS (A) ON – OFF
S203-2 : SPEAKERS (B) ON – OFF
S203-3 : CLOCK ON – OFF
The underlined indicates the switch position.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.


13
14
15
16
17
18
A
B
C
D
Q5: BALANCE CONTROL
LOUDNESS
FM MUT.
BALANCE
TERMINAL Ass'y
PRE OUT
POWER IN
L CH
R CH
S35: PHONO ASX-175
S37: ADAPTOR ASX-153
RECTIFIER Ass'y AWR-237
D1 S5151
D2 S5151R
D3,4 STV2H-0
TC/POWER SUPPLY Ass'y GWM-240
Q1~4 2SC2526
Q5~8 2SA1076
Q208: VOLUME & CONTROL
Q224: VOLUME CONTROL
VOL. CONT. V
AUTO
MANUAL
SCAN
SEARCH
S201: ASG-310
S202: ASX-186
S203: ASG-311
Q201,202,206,224 NJM4558DV
Q203 PA4008
Q204,205,208 PA5004
Q207 TA7318P
Q209 TC4069UBP
Q210,211 2SC2603/A/
Q212 2SD313P
Q213 2SA893A
Q214 2SC1890A
Q215 2SB507P
Q216 μPC78M12H
Q217 μPC78M15H
Q218 2SA1115/A/
Q219 2SB834
Q220,222 μPC78M05H
Q221,223 2SB764
D201,202,204,206,208,209, D216~223,227,228 1S1555 or US1035
D203,212,213 1S2471
D210,211,224~226 S1B01-02
D214 1G4B1-LC2
D215 1B4B1-LC2
D205,207 MZ-056
Q204,202: TONE AMP
Q203: ELECTRONIC SWITCH
Q204,205: TONE CONTROL
Q206: COMPARATOR & AF AMP
Q209: TIMING
Q207: COMPRESSOR
Q211: SWITCHING
Q210: SWITCHING
Q212~220,222: REGULATOR
Q221,223: SWITCHING
Q101,102: ABSORBER
Q103~124,133~136: POWER AMP
Q125,126,137~140: PROTECTION
Q101,102 2SC1775A
Q103,104 2SA979
Q105,106 2SC2291
Q107,108 2SA992
Q109,110 2SC1915
Q111,112,117,118,139 2SA1115/A/
Q115,116 2SA905
Q121,122 2SA904A
Q123,124 2SC1914A
Q133,134 2SC2275A
Q113,114,119,120,125,126,137,138 2SC2603/A/
Q135,136 2SA985A
Q140 2SD438
SP-A
SP-B
HEADPHONES
HEADPHONES JACK Ass'y
1/4 POWER COMPRESSOR
HOLD & DC AMP
DETECTS CIRCUIT
RESET
IRQ
ST BY
LED LEVEL METER MODULE AAV-306
S40: LINE VOLTAGE SELECTOR AKX-063
T2 ATT-887
T1 ATT-886
FUSE HOLDER Ass'y
FU2,3: AEK-119
FU4~7: AEK-122
C1,2: ACG-001
S38: POWER ASG-533
AC POWER CORD ADG-049
SWITCHED 100W MAX.
UNSWITCHED TOTAL 200W MAX.
FU1 10A: 110V,120V AEK-114
5A: 220V,240V AEK-108
AC110,120V 220,240V 50/60Hz
S39: LINE VOLTAGE SELECTOR AKR-034
110V
120V
220V
240V

6. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).
  560Ω 56×10^1 561 ..... RD¼PS $\boxed{5}\boxed{6}\boxed{1}$ J
  47kΩ 47×10^3 473 ..... RD¼PS $\boxed{4}\boxed{7}\boxed{3}$ J
  0.5Ω 0R5 .... RN2H $\boxed{0}\boxed{R}\boxed{5}$ K
  1Ω 010 .... RS1P $\boxed{0}\boxed{1}\boxed{0}$ K
  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).
  5.62kΩ 562×10^1 5621 .... RN¼SR $\boxed{5}\boxed{6}\boxed{2}\boxed{1}$ F
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
⚠ ★★	2SC2526-B* (2SC2526-G*) (2SC2526-X*)	Q1–Q4
⚠ ★★	2SA1076-B* (2SA1076-G*) (2SA1076-X*)	Q5–Q8

*hfe of these transistors (Q1–Q8) should have the same value.

Mark	Part No.	Symbol & Description
★	AAV-306	LED level meter module

FUSES

Mark	Part No.	Symbol & Description
⚠ ★★	AEK-114	FU1 Fuse (10A, for 110/120V)
⚠ ★★	AEK-108	FU1 Fuse (5A, for 220/240V)
⚠ ★★	AEK-119	FU2, FU3 Fuse (1A/125V)
⚠ ★★	AEK-122	FU4–FU7 Fuse (2A/125V)

P.C. BOARD ASSEMBLIES

Mark	Part No.	Symbol & Description
	GWK-198	Control assembly
	GWK-199	Connector assembly Switch assembly Alarm switch assembly
	GWE-178	Tuner assembly
		Antenna terminal assembly
	GWF-150	EQ/Function assembly
	GWS-390	Tape terminal assembly
	GWM-240	TC/Power supply assembly Headphones jack assembly
		Terminal assembly Fuse holder assembly
	AWR-237	Rectifier assembly
	AWH-114	Power amplifier assembly

OTHERS

Mark	Part No.	Symbol & Description
⚠	ACG-001	C1, C2 Ceramic capacitor (0.01/AC250V)
⚠ ★	ATT-886	T1 Power transformer
⚠ ★	ATT-887	T2 Power transformer
	ATB-638	T3 Bar-antenna assembly
⚠ ★★	ASG-533	S38 Push switch (POWER)
⚠ ★★	AKR-031	S39 Line voltage selector
⚠ ★★	AKX-063	S40 Line voltage selector
★★	ASH-016	S41 Slide switch (DE-EMPHASIS)
⚠	AKP-041	AC socket (AC OUTLETS)
⚠	ADG-049	AC power cord
	AKB-076	Terminal (AM STEREO OUT)
	AKE-105	Terminal (SPEAKERS)
	AKM-041	Jumper plug

Control Assembly (GWK-198)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEJA 100M 50	C1,C5
	CKDYB 391K 50	C2
	CKDYB 102K 50	C3
	CEB 100P 16	C4
	CCDSL 680J 50	C6

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/8PM □□□ J	R1–R21, R28–R104, R109–R157

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	TD6301AP	Q1,Q3
★★	PD6010	Q6
★★	PD6011	Q2
★★	TC4049BP	Q4
★★	M74LS42P	Q5
★★	TC5022BP	Q7,Q8
★★	2SA1115/A/	Q9,Q11,Q14–Q19,Q23–Q33
★★	2SC2603/A/	Q10,Q12,Q20–Q22,Q34–Q37
★	2-1K261	D1–D7
★	1S1555 (1S2473) (US1035)	D12–D26
★	AEL-363	D101–D108 LED (Red)
★	AAV-307	D109 LED array
★	AEL-392	D110 LED indicator (Tone)
★	AEL-391	D111 LED numeric display (Volume step)
★	AEL-378	D112 LED numeric display (Frequency/Time)

OTHERS

Mark	Part No.	Symbol & Description
★	ASS-017	X1 Ceramic resonator
★★	ASG-703	S1–S34 Tact switch

Connector Assembly (GWK-199)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 100M 50L	C201,C201
	CKDYB 102K 50	C203

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/8PM □□□ J	R201–R218

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SA1115/A/	Q202,Q203
★★	2SC2603/A/	Q201,Q204,Q205
★	2-1K261	D201,D203
★	1S1555 (1S2473) (US1035)	D202

OTHERS

Mark	Part No.	Symbol & Description
	APV-001	X200 Piezoelectric ceramic transducer

Switch Assembly

Mark	Part No.	Symbol & Description
★★	ASH-015	S300 Slide switch (AM CHANNEL STEP)
	CKDYF 103Z 50	C7

Alarm Switch Assembly

Mark	Part No.	Symbol & Description
★★	ASG-411	S400 Push switch (♪)

Tuner Assembly (GWE-178)

CAPACITORS

Mark	Part No.	Symbol & Description
	ACM-014	TC1–TC3 Ceramic trimmer
	ACM-006	TC4 Ceramic trimmer
	ACM-017	TC5 Ceramic trimmer
	ACM-015	TC7 Ceramic trimmer
	CEANL 010M 50	C42,C43,C50,C51,C53,C54
	CEA 100M 50L	C55,C87,C91
	CEA 101M 16L	C59
	CEA 101M 10L	C34,C58,C68
	CEA 010M 50L	C44,C45
	CEA 220M 50L	C52
	CEA 0R1M 50L	C8
	CEANL R47M 50	C69
	CEA 4R7M 50L	C37,C76
	CCDRH 150J 50	C6,C7,C10,C11,C19
	CCDCH 150J 50	C66
	CCDCH 220J 50	C65
	CCDRH 060D 50	C1,C2
	CCDRH 330J 50	C20
	CCDTH 080D 50	C21–C23,C74
	CCDCH 030C 50	C12
	ACG-018	C56 Ceramic (390p/50V, CH)
	CCDSL 220J 50	C3
	CCDSL 181J 50	C35,C36
	CCDSL 101J 50	C14
	CEA 3R3M 50L	C77
	CEA 1R5M 50L	C79
	CEA 221M 10L	C99
	CKDYB 102K 50	C84,C88
	CCDSL 010C 50	C95
	CQMA 153K 50	C83
	CQMA 103J 50	C64
	CQSA 332J 50	C46,C47
	CQSA 431J 50	C75
	CQSA 182J 50	C48,C49
	CCDCH 100D 50	C25
	CCDCH 020C 50	C24
	CGB R47K 500	C16
	CCDSL 151J 50	C28
	CEA 221M 35L	C72
	CKDYF 103Z 50	C4, C5, C9, C15, C17, C18, C26, C27, C38, C40, C60–C63, C70, C80, C82, C85, C86, C90, C92, C93, C98

Mark

RESIS

NOTE:

Mark

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SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	TD6301AP	Q1,Q3
★★	PD6010	Q6
★★	PD6011	Q2
★★	TC4049BP	Q4
★★	M74LS42P	Q5
★★	TC5022BP	Q7,Q8
★★	2SA1115/A/	Q9,Q11,Q14–Q19,Q23–Q33
★★	2SC2603/A/	Q10,Q12,Q20–Q22,Q34–Q37
★	2-1K261	D1–D7
★	1S1555 (1S2473) (US1035)	D12–D26
★	AEL-363	D101–D108 LED (Red)
★	AAV-307	D109 LED array
★	AEL-392	D110 LED indicator (Tone)
★	AEL-391	D111 LED numeric display (Volume step)
★	AEL-378	D112 LED numeric display (Frequency/Time)

OTHERS

Mark	Part No.	Symbol & Description
★	ASS-017	X1 Ceramic resonator
★★	ASG-703	S1–S34 Tact switch

Connector Assembly (GWK-199)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 100M 50L	C201,C201
	CKDYB 102K 50	C203

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/8PM □□□ J	R201–R218

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SA1115/A/	Q202,Q203
★★	2SC2603/A/	Q201,Q204,Q205
★	2-1K261	D201,D203
★	1S1555 (1S2473) (US1035)	D202

OTHERS

Mark	Part No.	Symbol & Description
	APV-001	X200 Piezoelectric ceramic transducer

Switch Assembly

Mark	Part No.	Symbol & Description
★★	ASH-015	S300 Slide switch (AM CHANNEL STEP)
	CKDYF 103Z 50	C7

Alarm Switch Assembly

Mark	Part No.	Symbol & Description
★★	ASG-411	S400 Push switch (♪)

Tuner Assembly (GWE-178)

CAPACITORS

Mark	Part No.	Symbol & Description
	ACM-014	TC1–TC3 Ceramic trimmer
	ACM-006	TC4 Ceramic trimmer
	ACM-017	TC5 Ceramic trimmer
	ACM-015	TC7 Ceramic trimmer
	CEANL 010M 50	C42,C43,C50,C51,C53,C54
	CEA 100M 50L	C55,C87,C91
	CEA 101M 16L	C59
	CEA 101M 10L	C34,C58,C68
	CEA 010M 50L	C44,C45
	CEA 220M 50L	C52
	CEA 0R1M 50L	C8
	CEANL R47M 50	C69
	CEA 4R7M 50L	C37,C76
	CCDRH 150J 50	C6,C7,C10,C11,C19
	CCDCH 150J 50	C66
	CCDCH 220J 50	C65
	CCDRH 060D 50	C1,C2
	CCDRH 330J 50	C20
	CCDTH 080D 50	C21–C23,C74
	CCDCH 030C 50	C12
	ACG-018	C56 Ceramic (390p/50V, CH)
	CCDSL 220J 50	C3
	CCDSL 181J 50	C35,C36
	CCDSL 101J 50	C14
	CEA 3R3M 50L	C77
	CEA 1R5M 50L	C79
	CEA 221M 10L	C99
	CKDYB 102K 50	C84,C88
	CCDSL 010C 50	C95
	CQMA 153K 50	C83
	CQMA 103J 50	C64
	CQSA 332J 50	C46,C47
	CQSA 431J 50	C75
	CQSA 182J 50	C48,C49
	CCDCH 100D 50	C25
	CCDCH 020C 50	C24
	CGB R47K 500	C16
	CCDSL 151J 50	C28
	CEA 221M 35L	C72
	CKDYF 103Z 50	C4, C5, C9, C15, C17, C18, C26, C27, C38, C40, C60–C63, C70, C80, C82, C85, C86, C90, C92, C93, C98

Mark	Part No.	Symbol & Description
	CKDYF 473Z 50	C29–C32, C57, C67, C73, C78, C81, C89, C94, C96
	CCDSL 070D 50	C33
	CCDSL 470J 50	C100
	CEA R47M 50L	C39

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	C92-048	VR1 Semi-fixed(47k-B)
★	ACP-036	VR2 Semi-fixed(10k-B)
★	ACP-037	VR3 Semi-fixed(22k-B)
	RD¼PM □□□ J	R1–R6, R8–R13, R16–R38, R40–R56, R58,–R77, R99–R113, R115–R131
	RN¼PQ □□□□ F	R39,R78
⚠	RD¼PMF □□□ J	R7,R14,R15,R57,R114

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SA1115/A/	Q11-Q13
★★	2SC2603/A/	Q8–Q10,Q15,Q19–Q21
★★	2SC2603/A/-F	Q14,Q22-Q24
★★	2SC461	Q26
★★	2SC535	Q2,Q5,Q6
★★	2SC1923	Q3
★★	2SK168	Q4
★★	P001	Q1
★★	PA3007-A (PA3007)	Q7
★★	PA4006-A	Q17
★★	M54922P	Q18
★★	LA1247	Q25
	SZ-027	D15
★	WZ-290	D12
★	MZ-100 (WZ-100)	D13,D14
★	1S1555	D3–D5,D7–D10
★	KV1320A-4	D1
★	KV1226-Y	D11

* KV1320A-4 consists of four twin vari-cap diodes with the indentical characteristics.

* KV1226-Y consists of two vari-cap diodes w[illegible] indentical characteristics.

COILS AND FILTERS

Mark	Part No.	Symbol & Description
	ATC-155	L1 FM ANT. coil
	ATC-142	L2 FM RF coil
	ATC-114	L3 FM RF coil
	ATH-049	L4,L7 RF choke coil
	ATC-077	L6 FM osc. coil
	ATE-039	T1 FM IF transformer
	ATE-055	T2 FM det. transformer
	ATB-068	T3 AM IF coil
	ATB-067	T4 AM osc. coil

Mark	Part No.	Symbol & Description
	ATF-107	F1–F3 FM ceramic fil
	ATF-089	F4,F5 FM low-pass filter
	ATF-121	F6 AM ceramic filter
★	ATF-125	F7 Ceramic resonator

OTHERS

Mark	Part No.	Symbol & Description
★	ASS-016	X1 Crystal resonator
	AKB-025	Terminal (From balun)

Antenna Terminal Assembly

Mark	Part No.	Symbol & Description
	ACM-015	TC6 Ceramic trimmer
	CKDYF 103Z 50	C71
	ATX-013	T100 Balun
	AKA-017	Terminal(ANTENNA)
	AKB-025	Terminal(To FM front end)

EQ/Function Assembly(GWF-150)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 471M 6L	C9,C10
	CEA 471M 16L	C7,C8
	CEANL 4R7M 50	C21,C22
	CEANL 100M 50	C49,C50
	CEANL 010M 50	C47,C48
	CEANL 100M 16	C46,C45
	CEA 101M 10L	C33,C34,C40
	CEA 2R2M 50L	C41
	CEA 221M 25L	C62
	CEA 471M 25L	C27,C28
	CEA 220M 25L	C39,C42,C43
	CEA 100M 50L	C44,C61
	CCDSL 101J 50	C23,C24
	CCDSL 271J 50	C25,C26
	CCDSL 221J 50	C1,C2,C5,C6
	CQMA 182J 50	C13,C14
	CCDSL 470J 50	C15,C16
	CQMA 682J 50	C11,C12
	CKDYB 102K 50	C17,C18,C37,C38
	CKDYB 562K 50	C19,C20
	CKDYB 821K 50	C35,C36
	CQMA 153J 50	C29–C32
	CQMA 122J 50	C51,C52
	CQMA 103J 50	C3,C4
	CKDYF 473Z 50	C65,C66
	CEA R47M 50L	C67

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RN½PQ □□□□ F	R21,R22
	RN¼PQ □□□□ F	R9,R10,R19,R20,R23,R24
⚠	RD¼PMF □□□ J	R47,R48,R101
	RD¼PM □□□ J	R1–R8, R11–R18, R25–R46 R49–R80, R103

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SK129A (2SK146)	Q1,Q2
★★	2SA1115/A/	Q3
★★	NJM4558DX (μPC4558C-P)	Q4
★★	NJM4558DV	Q5
★★	PA4008	Q6
★★	PA5004	Q8
★	US1035 (1S2076) (1S1555)	D1–D6,D9,D10
★	WZ-046	D11

OTHERS

Mark	Part No.	Symbol & Description	
★★	ASX-175	S1	Remote side switch (MM/MC)
★★	ASX-153	S3	Remote slide switch (ADAPTOR)
	AKB-078	Terminal(PHONO, AUX)	

Tape Terminal Assembly(GWS-390)

CAPACITORS

Mark	Part No.	Symbol & Description
	CCDSL 271J 50	C53–C60
	CKDYF 473Z 50	C63,C64

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD¼PM ☐☐☐ J	R81–R100,R102,R104–R106

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	PA4008	Q7

OTHERS

Mark	Part No.	Symbol & Description	
★★	ASX-153	S2	Remote slide switch (TAPE COPY)
	AKB-078	Terminal(TAPE/ADAPTOR)	

TC/Power Supply Assembly(GWM-240)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 221M 100L	C235,C238
	CEA 101M 63L	C271,C272
	CEA 470M 63L	C237,C240
	CEA 102M 35L	C241
	CEA 471M 35L	C243
	CEA 101M 35L	C244
	CEA 331M 25L	C269,C270
	CEA 101M 25L	C230,C246,C247
	CEA 222M 16L	C248
	CEA 101M 16L	C242,C249
	CEA 101M 10L	C215, C217, C219, C221, C223, C225,C258–C260,C251
	CEA 472M 6L	C252,C253
	CEA 6R8M 50L	C233
	CEA 3R3M 50L	C234
	CEA 010M 50L	C267,C268
	CEA 100M 50L	C201, C202, C256, C257, C261–C264, C276–C279
	CEA 2R2M 50L	C275
	CEA R68M 50L	C273,C274
	CQMA 473K 50	C203,C204,C231,C232,C255
	CQMA 392K 50	C205,C206
	CKDYB 471K 50	C207,C208
	CKDYB 102K 50	C209,C210
	CCDSL 271J 50	C211–C214
	CCDSL 101J 50	C236,C239,C245
	CKDYB 103K 50	C227
	CKDYB 152K 50	C228,C229
	CKDYB 222K 50	C265,C266
	CEA 332M 16L	C250,C280
	CCDSL 100D 50	C281–C284
	CEANL 0R1M 50	C254

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
⚠	RD¼PMF ☐☐☐ J	R251,R256,R266,R267,R271,R272
	RS2P ☐☐☐ J	R301,R302
	RD¼PM ☐☐☐ J	R201–R250, R252–R255, R257–R265, R268–R270, R273–R300, R303–R306

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	NJM4558DV	Q201,Q202,Q206,Q224
★★	PA4008	Q203
★★	PA5004	Q204,Q205,Q208
★★	TC4069UBP	Q209
★★	TA7318P-A	Q207
★★	μPC78M05H	Q220,Q222
★★	μPC78M12H	Q216
★★	μPC78M15H	Q217
★★	2SA839A	Q213
★★	2SA1115/A/	Q218
★★	2SB507P	Q215
★★	2SB764	Q221,Q223
★★	2SB834	Q219
★★	2SC1890A	Q214
★★	2SC2603/A/	Q210,Q211

Mark	Part No.	Symbol & Description
★★	2SD313P	Q212
★	1S2471	D203,D212,D213
★	1S1555 (US1035)	D201, D202, D204, D206, D208, D209, D216–D223, D227, D228
★	1B4B1-LC2	D215
★	1G4B1-LC2	D214
★	SIB01-02	D210,D211,D224–D226
★	MZ-056	D205,D207

OTHERS

Mark	Part No.	Symbol & Description
★★	ASG-310	S201 3-ganged push switch (MONO/MUTE OFF, TUNING)
★★	ASX-186	S202 4-ganged push switch (SUBSONIC, MEMORY, MM/MC-remote, ADAPTOR-remote)
★★	ASG-311	S203 3-ganged push switch (SPEAKERS, CLOCK)
	PBZ30P060FMC	Screw 3 x 6

Headphones Jack Assembly

Mark	Part No.	Symbol & Description
	AKN-030	Phone jack(PHONES)

Terminal Assembly

Mark	Part No.	Symbol & Description
	AKB-078	Terminal (PRE OUT/POWER AMP IN)

Rectifier Assembly(AWR-237)

CAPACITORS

Mark	Part No.	Symbol & Description
	ACG-019	C1,C2 Ceramic(0.01/150V)
	ACH-210	C3,C4 Electrolytic (15000/71V)

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RS2P 103J	R1,R2

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
⚠ ★	S5151	D1
⚠ ★	S5151R	D2
⚠ ★	STV2H-O	D3,D4

Power Amplifier Assembly(AWH-114)

CAPACITORS

Mark	Part No.	Symbol & Description
	CQMA 823K 50	C137,C138
	CQMA 332K 250	C113,C114
	CKDYB 472K 50	C135,C136
⚠	CCDSL 221K 500	C121,C122,C127,C128
	CCDSL 470J 50	C105–C108
	CCDSL 820J 50	C109–C112
	CCDSL 221J 50	C103,C104
	ACG-009	C131–C134,C126 Ceramic(0.047/150V)
	CEANL 4R7M 50	C101,C102
	CEA 471M 6L	C139
	CEA 101M 25L	C140
	CEANP R22M 50	C129,C130

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	ACP-062	VR1,VR2 Semi-fixed(470k-B)
★	ACP-019	VR3,VR4 Semi-fixed(100-B)
★	ACP-010	VR5,VR6 Semi-fixed(100k-B)
⚠	ACN-114	R183–R186 Wire wound (0.47 + 0.47/5W + 5W)
⚠	RS2P □□□ J	R189,R190
⚠	RS1P □□□ J	R121,R122,R143,R144
⚠	RS1PF □□□ J	R187,R188
	RD½PS □□□ J	R196
⚠	RD¼PMFL □□□ J	R131–R138
⚠	RD¼PMF □□□ J	R109, R110, R113, R114, R117, R118, R123, R124, R127–R130, R139–R142, R147, R148, R153–R156,R159–R164,R171–R174,R195
	RD¼PM □□□ J	R101–R108, R111, R112, R115, R116, R119, R120, R125, R126, R145, R146, R149–R152, R157, R158, R167–R170, R175–R182, R191–R194, R199–R201

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SC1775A-E*	Q101,Q102
★★	or 2SC1775A-F*	
★★	2SA979-F*	Q103,Q104
★★	or 2SA979-G*	

*hfe of Q101 and Q102 should have the E-rank, if Q103 and Q104 have the F-rank.

*hfe of Q101 and Q102 should have the F-rank, if Q103 and Q104 have the G-rank.

Mark	Part No.	Symbol & Description
★★	2SC1915	Q109,Q110
★★	2SC1914A	Q123,Q124
⚠ ★★	2SC2275A-P* (2SC2275A-Q*)	Q133,Q134
⚠ ★★	2SA985A-P* (2SA985A-Q*)	Q135,Q136

*hfe of these transistors(Q133–Q136) should have the same value.

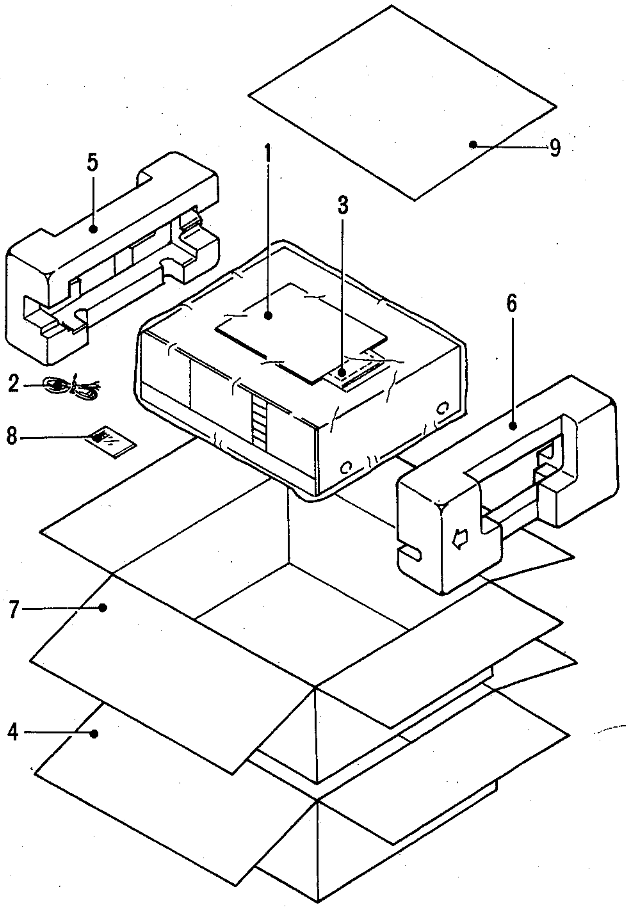
Mark	Part No.	Symbol & Description
★★	2SC2603/A/	Q113, Q114, Q119, Q120, Q125, Q126, Q137, Q138
★★	2SC2291	Q105,Q106
★★	2SA992-E	Q107,Q108
★★	2SA904A	Q121,Q122
★★	2SA905	Q115,Q116
★★	2SA1115/A/	Q111,Q112,Q117,Q118,Q139
★★	2SD438	Q140
★	WZ-061 (MZ-061)	D101–D106
★	KZL140	D131
★	1S1555 (US1035)	D113–D116
★	WZ-046	D135,D136
★	1S2471	D129,D130,D132,D134
★	10E2	D111,D112,D117,D118
★	TH103-2	Th101,Th102

OTHERS

Mark	Part No.	Symbol & Description
	ASR-068	RL1 Relay
	RBZ30P060FMC	Screw 3 x 6

7. PACKING

Mark	No.	Part No.	Description
	1.	ARB-469	Operating instructions
	2.	ADH-004	T-type FM antenna
	3.	AAN-029	Station card set
	4.	AHE-020	Packing case
	5.	AHA-313	Side pad L
	6.	AHA-314	Side pad R
	7.	AHC-064	Inside packing
⚠ ★★	8.	AEK-114	Fuse (10A)
⚠ ★★		AEK-108	Fuse (5A)
	9.	AHB-111	Cardboad spacer

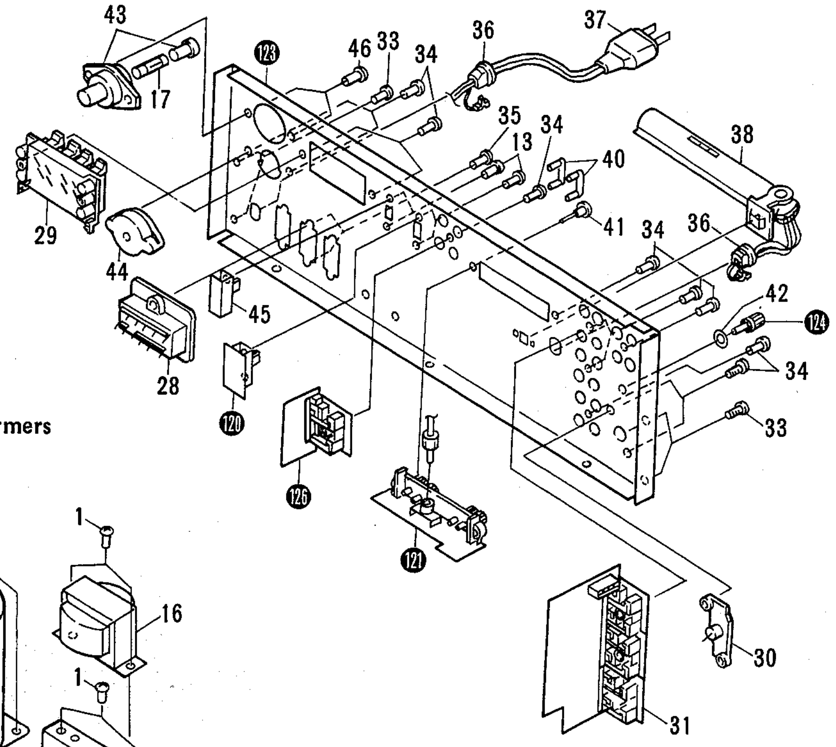


8. EXPLODED VIEW

Interior Components

Please refer to the SX-8/KU service manual with the exception of this exploded view.

- **Rear Panel**


43
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123
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120
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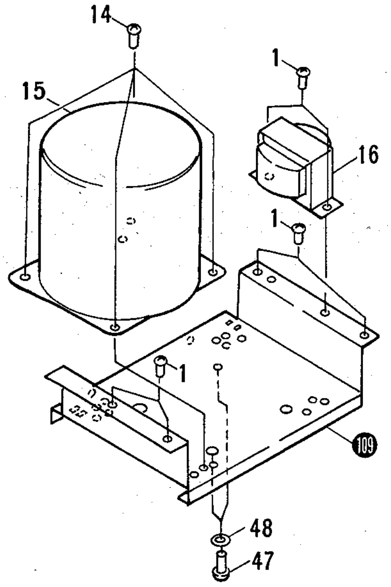
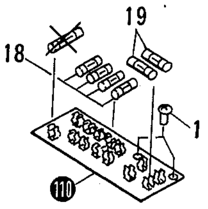
121
30
31

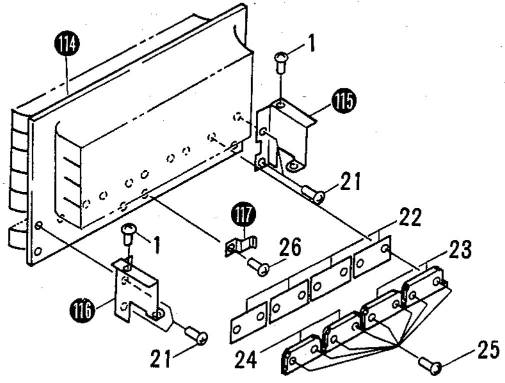
- **Power Transformers**


14
15
1
16
1
1
109
48
47

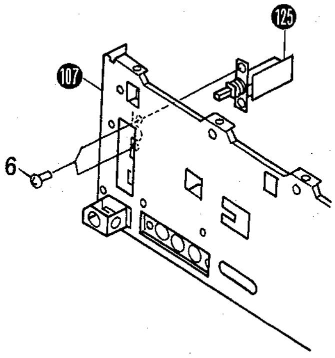
- **Fuse Holder Assembly**



- **Heat Sink**


114
1
115
21
22
117
1
26
23
116
21
24
25

- **Sound Alarm Switch**



Parts List of Interior Components

NOTES:
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Description
	1.	VBZ30P060FMC	Screw 3 x 6
	2.	AEC-352	Nylon rivet
⚠ ★★	3.	ASG-533	Push switch (POWER)
	4.	GWM-240	TC/Power supply assembly
	5.	GWE-178	Tuner assembly
	6.	VMZ30P060FMC	Screw 3 x 6
	7.	AEC-883	Collar
	8.	AEC-884	Bush
	9.	ABN-068	Stud
	10.	VBZ30P160FMC	Screw 3 x 16
	11.	GWK-198	Control assembly
★	12.	AAV-306	LED level meter module
	13.	BMT30P050FZK	Screw 3 x 5
	14.	VTZ40P080FMC	Screw 4 x 8
⚠ ★	15.	ATT-886	Power transformer
⚠ ★	16.	ATT-887	Power transformer
⚠ ★★	17.	AEK-114	Fuse (10A, for 110/120V)
⚠ ★★		AEK-108	Fuse (5A, for 220/240V)
⚠ ★★	18.	AEK-122	Fuse (2A)
⚠ ★★	19.	AEK-119	Fuse (1A)
	20.	AWH-114	Power amplifier assembly
	21.	VBZ30P080FMC	Screw 3 x 8
	22.	AEC-488	Mica wafer
⚠ ★★	23.	2SA1076-B or G or X*	(Q1, Q2)
⚠ ★★	24.	2SC2526-B or G or X*	(Q3, Q4)
	25.	ABA-258	Screw with washer

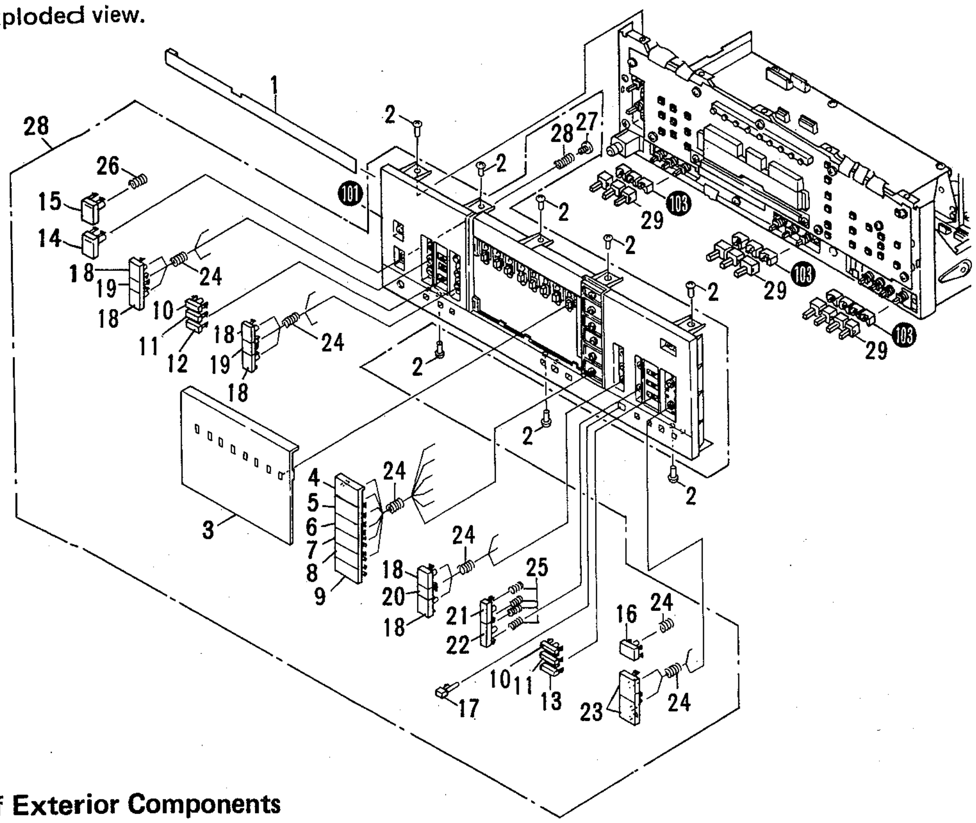
* hfe of transistors (Q1–Q4) should have the same value.

Mark	No.	Part No.	Description
	26.	ABA-234	Screw with washer 3 x 12
	27.	AWR-237	Rectifier assembly
⚠	28.	AKP-041	AC socket (AC OUTLETS)
	29.	AKE-105	Terminal (SPEAKERS)
	30.	AKB-076	Terminal (AM STEREO OUT)
	31.	GWS-390	Tape terminal assembly
	32.	GWF-150	EQ/Function assembly
	33.	BBT30P080FZK	Screw 3 x 8
	34.	BBZ30P100FZK	Screw 3 x 10
	35.	MTZ30P100FZK	Screw 3 x 10
	36.	AEC-327	Strain relief
⚠	37.	ADG-049	AC power cord
	38.	ATB-638	Bar-antenna assembly
	39.	PMZ30P050FZB	Screw 3 x 5
	40.	AKM-041	Jumper plug

Mark	No.	Part No.	Description
	41.	ABA-115	Terminal screw
	42.	WA35F100N080	Flat washer
⚠ ★★	43.	AKR-031	Line voltage selector
⚠ ★★	44.	AKX-063	Line voltage selector
★★	45.	ASH-016	Slide switch
	46.	BMZ30P080FZB	Screw 3 x 8
	47.	BMZ50P100FMC	Screw 5 x 10
	48.	WS50FMC	Spring washer
	101.		Ground terminal 7-P
	102.		Side frame L
	103.	GWK-199	Connector assembly
	104.		Headphones jack assembly
	105.		Cushion
	106.		Remote belt
	107.		Panel stay
	108.		Sopper
	109.		Transformer frame
	110.		Fuse holder assembly
	111.		P. C. board holder
	112.		Center frame
	113.		P. C. board holder
	114.		Heat sink
	115.		Heat sink holder B
	116.		Heat sink holder A
	117.		Varistor holder
	118.		Capacitors holder
	119.		P. C. board holder
	120.		Switch assembly
	121.		Antenna terminal assembly
	122.		Side frame R
	123.		Rear panel
	124.		Terminal (GND)
	125.		Alarm switch assembly
	126.		Terminal assembly

Exterior Components

Please refer to the SX-8/KU service manual with the exceptions of this exploded view.



Parts List of Exterior Components

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the symbols ★★ and ★ .*
  ★★ : GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model No., temperature, humidity, etc.

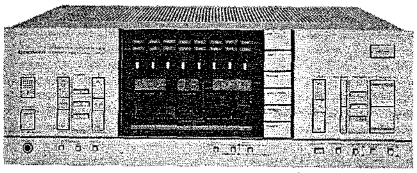
Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	ANR-450	Slider assembly		21.	AAD-474	Knob (BALANCE L)
	2.	VMZ30P060FMC	Screw 3 x 6		22.	AAD-475	Knob (BALANCE R)
	3.	ANR-492	Display cover		23.	AAD-476	Knob (VOLUME)
	4.	AAD-457	Knob (FM)		24.	ABH-091	Coiled spring
	5.	AAD-458	Knob (AM)		25.	ABH-092	Coiled spring
	6.	AAD-459	Knob (PHONO)		26.	ABH-093	Coiled spring
	7.	AAD-460	Knob (AUX/VIDEO)		27.	AEC-875	Stopper
	8.	AAD-461	Knob (TAPE 1)		28.	ANM-118	Front panel assembly
	9.	AAD-462	Knob (TAPE 2)		29.	AAD-484	Knob
	10.	AAD-463	Knob (PRESET A)		30.	ANE-380	Top cover
	11.	AAD-464	Knob (PRESET B)		31.	ABA-193	Screw 4 x 8
	12.	AAD-465	Knob (PRESET C)		32.	VBZ30P060FMC	Screw 3 x 6
	13.	AAD-466	Knob (LOUDNESS)		33.	AEC-083	Foot assembly
	14.	AAD-467	Knob (POWER)		34.	VTZ40P100FMC	Screw 4 x 10
	15.	AAD-468	Knob (♪)		35.	.....	
	16.	AAD-469	Knob (MUTING)				
	17.	AAD-470	Knob (MEMORY)		101.		Front panel
	18.	AAD-471	Knob (TONE, TUNING)		102.		Cushion
	19.	AAD-472	Knob (TONE, FLAT)		103.		Flexible joint
	20.	AAD-473	Knob (Stop)		104.		Bottom plate

3392

PIONEER®

Service Manual

CIRCUIT DESCRIPTIONS



Shown the photo is Model SX-9.

ORDER NO.
ARP-088-0

COMPUTER CONTROLLED
STEREO RECEIVER

SX-9
SX-8

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
U.S. PIONEER ELECTRONICS CORPORATION 85 Oxford Drive, Moonachie, New Jersey 07074, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Luithagen-Haven 9, 2030 Antwerp, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

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3392

CIRCUIT DESCRIPTIONS

Model SX-9 (and SX-8) are new types of receivers featuring microcomputers for easier operation. The AM/FM tuner stages incorporate quartz PLL synthesizers for high stability, while the power amplifier stage is non-switching amplifier which achieves class A quality with class B efficiency.

Outline of Main Stage

The overall composition is outlined in the block diagram on pp. 5-6.

- **Tuner Stage**

SX-9	SX-8
I.D. MOS FET single-stage RF amplifier plus twin vari-cap tuning circuit (equivalent to 4-ganged tuning capacitor) in FM front-end.	Same as SX-9
PLL system switching signal generator, chopper type switching circuit, pilot signal automatic canceller in stereo decoder stage.	Same as SX-9
Vari-cap tuning circuit (equivalent to 2-ganged tuning capacitor) in AM tuning stage and AM tuner IC (LA1247).	Same as SX-9

- **FM/AM Synthesizer Stage**

SX-9	SX-8
Improved S/N ratio achieved by pulse-swallow system for FM reception. S/N ratio 80 dB (Mono) 76 dB (Stereo)	Same as SX-9
Frequency memory (presetting capability for up to 8 stations in each band).	Same as SX-9
3 tuning mode: MANUAL: Frequency changed in single steps each time the TUNING UP or DOWN key is pressed. Frequencies scanned when pressed continuously, the scanning being stopped as soon as the key is released. STATION SCAN : Frequencies scanned when either TUNING UP or DOWN key is pressed. Scanning pauses for 5 seconds when a broadcasting station is tuned, and stops altogether if the STOP key is pressed. Otherwise, the scanning is resumed. STATION SEARCH : Frequencies scanned when either TUNING UP or DOWN key is pressed, and stopped when a broadcasting station is tuned.	Same as SX-9

- **Amplifier Stage**

SX-9	SX-8
Equalizer amplifier features low noise twin FET ICL differential amplifier in first stage, and operational amplifier (IC) in second stage for MC cartridges. S/N ratio 80 dB (MM) 67 dB (MC)	Same as SX-9
Microcomputer controlled electronic switching IC (PA4008) for function selector.	Same as SX-9
Microcomputer controlled VCA IC (PA5004) volume control features 32-step control, presettable levels and audio muting (-25 dB).	Same as SX-9
Microcomputer controlled VCA IC (PA5004) and electronic switching IC (PA4008) tone control features 15-step (±7-step) control, presettable 3 levels (A, B, C).	Microcomputer controlled VCA IC (PA5004) and electronic switching IC (PA4008) tone control features 15-step (±7-step) control presettable 2 levels (A, B).
Non-switching amplifier employed in power amplifier stage. Output power 125W + 125W (20 Hz – 20 kHz) Rated distortion 0.005%	Same as SX-9 Output power 100 W + 100W (20 Hz – 20 kHz) Rated distortion 0.005%

- **Display Stage**

SX-9	SX-8
5-digit LED numeric display of tuned frequency.	Same as SX-9
LED numeric display of electronic volume control levels.	Same as SX-9
LED numeric display of time (built-in quartz clock function).	Same as SX-9
LED display of tone control.	Same as SX-9
10-point LED display of output power.	Same as SX-9
3-point LED SIGNAL indicator indicating signal strength of tuned frequency.	Same as SX-9

Tuner Stage

- **I.D. MOS FET**

The FM front-end RF amplifier in model SX-9 (and SX-8) features an I.D. MOS FET (ion-implantation dual gate MOS FET) - P001 manufactured by Pioneer Semiconductor Laboratory. The major features of this FET - P001 include high gain, low noise, low distortion and low IM (P.G. 25dB/100MHz, N.F. 2dB/100MHz, I.M. −54dB/107dBμ) as a result of an extremely accurate short channel obtained by a "self aligning" operation involving a "local silicon oxidation" process. Furthermore, a 0.4μ narrow channel (1/3rd to 1/5th the width in normal components) has been achieved by the ion-implantation double diffusion construction. Use of this FET in the FM front-end greatly assits in improving sensitivity and reducing interference.

- **Pulse-Swallow PLL Synthesizer**

When the VCO (Voltage Controlled Oscillator) frequency is very high and the CMOS programmable divider operating frequency is exceeded, the PLL will cease to function. Two methods are presently available to resolve this problem. In one of these methods (the fixed divider system), an ECL (Emitter to Emitter Coupled Logic) prescaler is positioned in front of the programmable divider. And when, for example, a 1/10 prescaler is employed to obtain 25kHz step frequencies, the reference frequency will be 2.5kHz. This frequency is very low and cannot be adequately removed by the low-pass filter. As a result, signal components are leaked into the mixer leading to deterioration in the S/N ratio. This is one of the main disadvantages of the fixed divider system.

The other method available is the pulse-swallow system which employs a special frequency divider called a "two-modulus prescaler" instead of the prescaler used in the fixed divider system. In this method, a 25kHz step synthesizer will generate a 25kHz reference frequency and a 50kHz step synthesizer will generate a 50kHz reference frequency, resulting in a much higher S/N ratio than in the fixed prescaler system.

The pulse-swallow system employed in the SX-9 is incorporated in an IC (M54922P) controlled by microcomputer.

Amplifier Stage

- **Non-Switching Amplifier**

In non-switching amplifiers, the output stage transistor bias is controlled on the basis of class B operating point in order to maintain the operation within the operating region (between cutoff and saturation) and thereby suppress the generation of switching distortion.

The basic non-switching amplifier circuitry is outlined in Fig. 1-2. To simplify the diagram, transistor V_{BE} and diode V_f, E_1 and E_2 are assumed to be 0.6V and the transistor base current is disregarded. While no input signal is applied, the voltage drop across R_5 and R_6 may also be disregarded. And if the voltage across R_1 and R_2 due to idle current is ignored, the voltage at different positions will be as shown in the diagram.

When an input signal is applied, a voltage will be generated across R_1 by NPN stage (Q1/Q3) operation during the positive portion of the signal. This voltage is applied to the Q_5 emitter-follower (voltage gain of about 1) resulting in almost the same voltage being generated across R_5. This voltage is then added to the output stage bias voltage. Hence, the PNP stage (Q2/Q4) maintains the same bias conditions as when no signal was applied, which means there is no cutoff. Likewise, the NPN stage maintains the same bias conditions during the negative portion of the signal as when no signal was applied, again eliminating any cutoff.

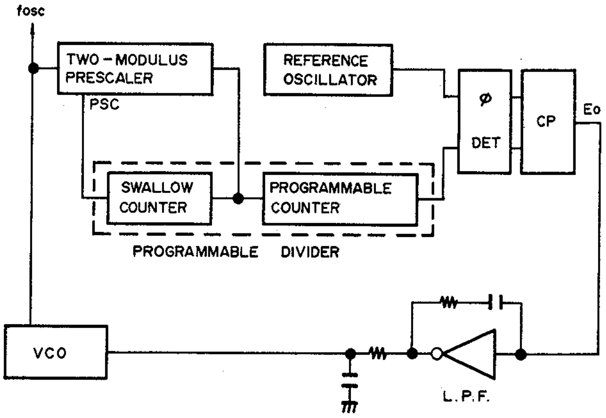


Fig. 1-1 Pulse swallow system

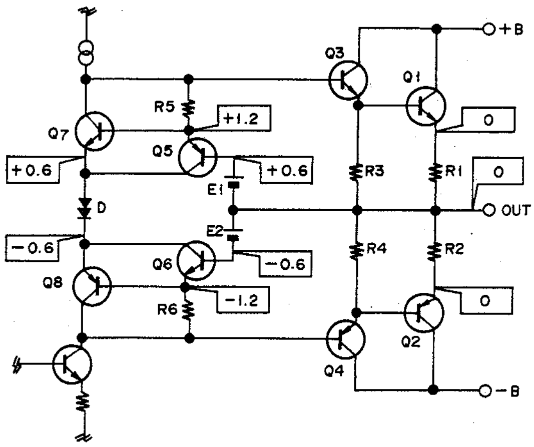


Fig. 1-2 Basic circuitry of Non Switching Amplifier

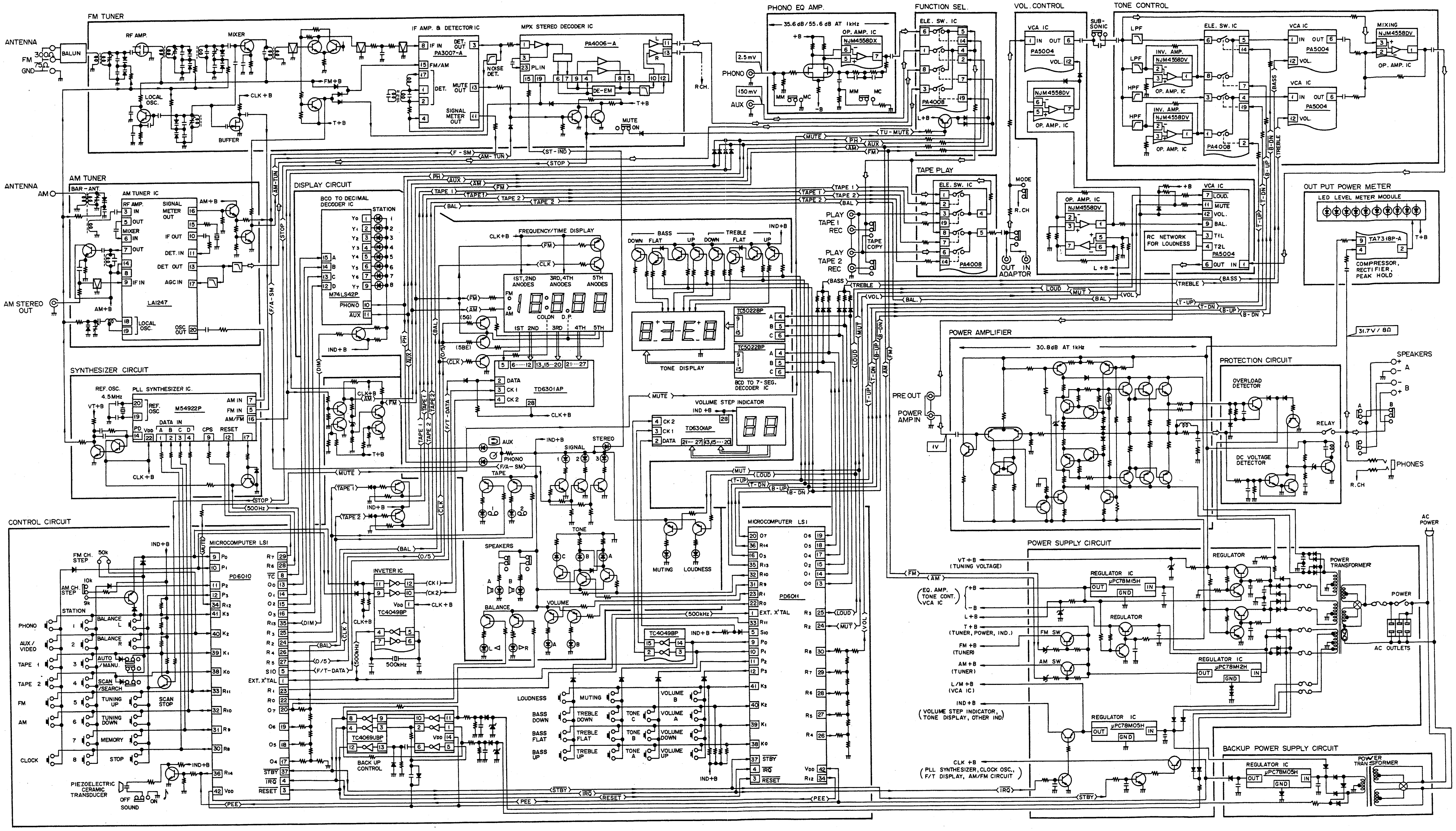
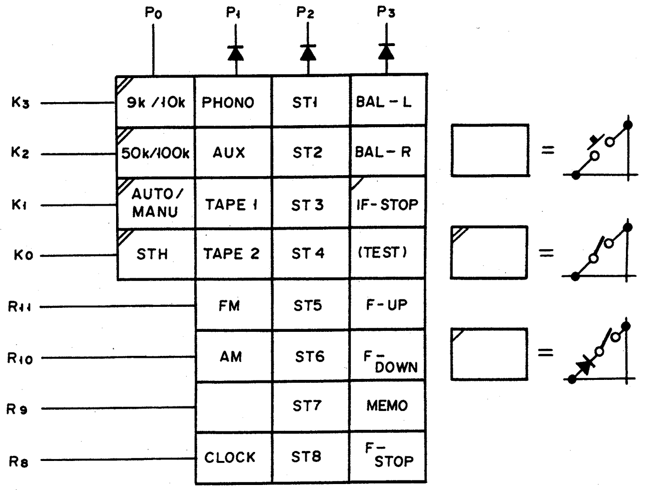

FM TUNER
ANTENNA
FM 300Ω 75Ω
GND
BALUN
RF AMP.
MIXER
LOCAL OSC.
BUFFER
IF AMP. & DETECTOR IC
PA3007-A
MPX STEREO DECODER IC
PA4006-A
NOISE DET.
DE-EM
MUTE ON
R.CH.
PHONO EQ AMP.
35.6dB/55.6dB AT 1kHz
OP. AMP. IC
NJM4558DX
2.5mV
PHONO
150mV
AUX
MM MC
PA4008
FUNCTION SEL.
ELE. SW. IC
VOL. CONTROL
VCA IC
PA5004
SUB-SONIC
TONE CONTROL
LPF
HPF
INV. AMP.
NJM4558DV
OP. AMP. IC
MIXING
AM TUNER
ANTENNA AM
BAR-ANT
AM TUNER IC
LA1247
AM STEREO OUT
DISPLAY CIRCUIT
BCD TO DECIMAL DECODER IC
M74LS42P
STATION
FREQUENCY/TIME DISPLAY
TD6301AP
BASS
TREBLE
DOWN FLAT UP
TC5022BP
TONE DISPLAY
BCD TO 7-SEG. DECODER IC
VOLUME STEP INDICATOR
TD6301AP
TAPE PLAY
PLAY TAPE 1 REC
PLAY TAPE 2 REC
TAPE COPY
MODE
R.CH
OUT IN ADAPTOR
RC NETWORK FOR LOUDNESS
OUT PUT POWER METER
LED LEVEL METER MODULE
TA7318P-A
COMPRESSOR, RECTIFIER, PEAK HOLD
31.7V/8Ω
SPEAKERS A B
POWER AMPLIFIER
30.8dB AT 1kHz
PRE OUT
POWER AMP IN
PROTECTION CIRCUIT
OVERLOAD DETECTOR
DC VOLTAGE DETECTOR
RELAY
PHONES
SYNTHESIZER CIRCUIT
REF. OSC. 4.5MHz
PLL SYNTHESIZER IC
M54922P
CONTROL CIRCUIT
MICROCOMPUTER LSI
PD6010
FM CH. STEP
AM CH. STEP
STATION
PHONO
AUX/VIDEO
TAPE 1
TAPE 2
FM
AM
CLOCK
BALANCE L
BALANCE R
AUTO/MANU.
SCAN/SEARCH
TUNING UP
TUNING DOWN
MEMORY
STOP
SCAN STOP
PIEZOELECTRIC CERAMIC TRANSDUCER
OFF ON SOUND
INVETER IC
TC4049BP
500kHz
TC4069UBP
BACK UP CONTROL
SPEAKERS
BALANCE
VOLUME
TONE
SIGNAL
STEREO
MUTING
LOUDNESS
MICROCOMPUTER LSI
PD6011
EXT. X'TAL
LOUDNESS
BASS DOWN
BASS FLAT
BASS UP
TREBLE DOWN
TREBLE FLAT
TREBLE UP
VOLUME
POWER SUPPLY CIRCUIT
VT+B (TUNING VOLTAGE)
EQ. AMP. TONE CONT. VCA IC
T+B (TUNER, POWER, IND.)
FM+B (TUNER)
AM+B (TUNER)
L/M+B (VCA IC)
IND+B (VOLUME STEP INDICATOR, TONE DISPLAY, OTHER IND)
CLK+B (PLL SYNTHESIZER, CLOCK OSC., F/T DISPLAY, AM/FM CIRCUIT)
FM SW
AM SW
REGULATOR IC
μPC78M15H
μPC78M12H
μPC78M05H
REGULATOR
POWER TRANSFORMER
AC POWER
POWER
AC OUTLETS
BACKUP POWER SUPPLY CIRCUIT

Fig. 1-3 Block diagram of SX-9/S/G

Control Section

The SX-9 (and the SX-8) features two 4-bit microcomputers, the PD6010 and the PD6011. The former is used in controlling the quartz PLL synthesizer tuner stage, tuned frequency and time displays, function switching, and the balance control circuit. The latter is used in controlling the volume and tone control circuits and related display circuits. The PD6010 pin description is given in Fig. 1-5.

The control system in the SX-8 differs from that in the SX-9 in that there is no sound indicator, and there are only two tone preset memories.


P0
P1
P2
P3
K3
K2
K1
K0
R11
R10
R9
R8
=
=
=

	P0	P1	P2	P3
K3	9k /10k	PHONO	ST1	BAL - L
K2	50k/100k	AUX	ST2	BAL - R
K1	AUTO/ MANU	TAPE 1	ST 3	IF-STOP
K0	STH	TAPE 2	ST 4	(TEST)
R11		FM	ST5	F-UP
R10		AM	ST6	F-DOWN
R9			ST7	MEMO
R8		CLOCK	ST8	F-STOP

Fig. 1-4 Input key matrix for PD6010

PD6010 Key Matrix Description (See Fig. 1-4)

9k/10k : AM reception frequency step selection

AM frequencies can be changed in 9kHz or 10kHz steps, depending on the position of the AM CHANNEL STEP selector on the rear panel. Switch to the broadcasting channel plan used in your area.

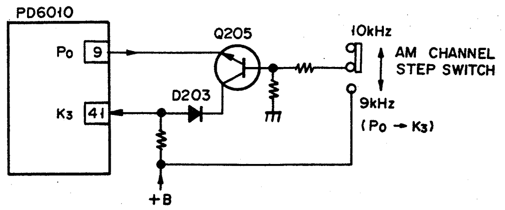

PD6010
P0
9
K3
41
Q205
D203
+B
10kHz
AM CHANNEL STEP SWITCH
9kHz
(P0 → K3)

Fig. 1-6 AM channel step selection

PD6010

Pin No.	Symbol	Description		
1	Extal	Clock pulse input (500 kHz)		
2	Xtal	Oscillator output (open)		
3	$\overline{\text{RESET}}$	Reset input (effective low)		
4	$\overline{\text{IRQ}}$	Inhibit mode control 1		
5	SO	Frequency/Time display data output		
6	SI	(ground)		
7	$\overline{\text{SC}}/\overline{\text{TO}}$	(open)		
8	$\overline{\text{TC}}$	Built-in clock input (500 Hz)		
9	P0	CK1	Data transfer clock output	
10	P1	CK2		
11	P2	Key scan clock output		
12	P3			
13	O0	A	STATION indicators/PHONO, AUX function control (4-bit BCD code)	
14	O1	B		
15	O2	C		
16	O3	D		
17	O4	BALANCE control data output		
18	O5			
19	O6			
20	O7	BALANCE R indicator output		
21	VSS	(ground)		
22	R0	BALANCE L indicator output		
23	R1	Connect to PD6011 (R11)		
24	R2	TAPE 2 indicator output		
25	R3	TAPE 1 indicator output		
26	R4	Clock colon (:) indicator output		
27	R5	FM 5-th digit control output (0/5)		
28	R6	RESET	Data transfer clock output	
29	R7	CPS		
30	R8	A	Synthesizer control data output	Key input
31	R9	B		
32	R10	C		
33	R11	D		
34	R12	Muting output		
35	R13	STATION indicator brightness control		
36	R14	Connect to PD6011 (R12)		
37	$\overline{\text{STBY}}$	Inhibit mode control 2		
38	K0	Key input		
39	K1			
40	K2			
41	K3			
42	VDD	+5V power source		

Fig. 1-5 Pin description for PD6010

50k/100k : FM reception frequency step selection

The S/G type (U.S. military model) and S type (general export model) have been wired for 50kHz step channels, while the KU type (U.S.A. model) and KC type (Canada model) have been wired for 100kHz step channels. The jumper wire (JP149) on the connector assembly is connected for 50kHz step channels, and disconnected for 100kHz step channels.

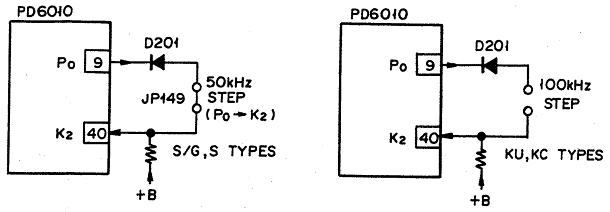

PD6010
P0
9
K2
40
D201
JP149
50kHz STEP
(P0 → K2)
S/G, S TYPES
+B
PD6010
P0
9
K2
40
D201
100kHz STEP
KU, KC TYPES
+B

Fig. 1-7 FM channel step selection

AUTO/MANUAL, STH : Tuning mode selection

(See page 2.)

The tuner is tuned manually when the front panel AUTO/MANUAL switch is in the MANUAL position, while the SCAN/SEARCH switch is used when in the AUTO position. Although the STH key (P0 → K0) input has priority over the AUTO/MANUAL key (P0 → K1) input in the PD6010 input key matrix, the SX-9 has been wired so that the SCAN/SEARCH switch will operate only when the AUTO/MANUAL switch is in the AUTO position.

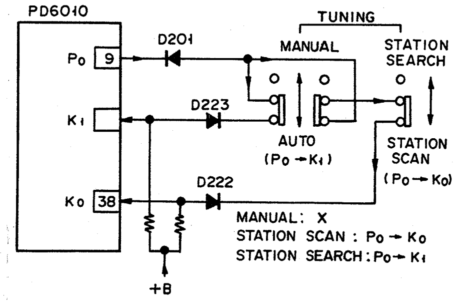

PD6010
P0
9
K1
K0
38
D201
D223
D222
+B
TUNING
MANUAL
STATION SEARCH
AUTO
(P0 → K1)
STATION SCAN
(P0 → K0)
MANUAL: X
STATION SCAN : P0 → K0
STATION SEARCH : P0 → K1

Fig. 1-8 Tuning mode selection

PHONO : PHONO function selector

The PD6010 passes a 4-bit BCD code (LLLH) to M74LS42P when the front panel PHONO button is pressed. M74LS42P is encoded, and a low level output appears at pin 10. The PHONO indicator lamp thus comes on, and the PHONO channel of the function switch (electronic switch with low level active) is turned on.

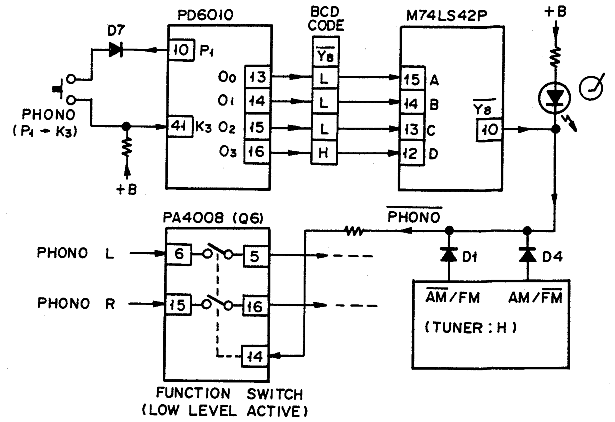

PD6010
D7
10
P1
PHONO
(P1 → K3)
41
K3
O0
O1
O2
O3
13
14
15
16
+B
BCD CODE
Y8
L
L
L
H
M74LS42P
15 A
14 B
13 C
12 D
Y8
10
+B
PA4008 (Q6)
PHONO L
PHONO R
6
5
15
16
14
FUNCTION SWITCH
(LOW LEVEL ACTIVE)
PHONO
D1
D4
AM/FM
AM/FM
(TUNER : H)

Fig. 1-9 PHONO function selection

AUX : AUX function selector

The PD6010 passes a 4-bit BCD code (HLLH) to M74LS42P when the front panel AUX/VIDEO button is pressed. M74LS42P is encoded, and a low level output appears at pin 11. The AUX indicator lamp thus comes on, and the AUX channel of the function switch is turned on.

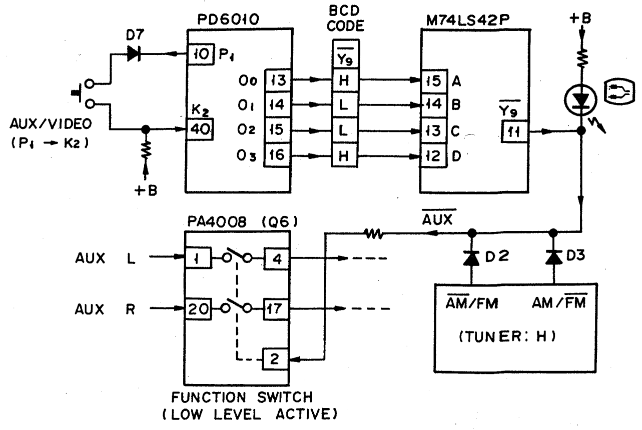

PD6010
D7
10
P1
AUX/VIDEO
(P1 → K2)
K2
40
O0
O1
O2
O3
13
14
15
16
+B
BCD CODE
Y9
H
L
L
H
M74LS42P
15 A
14 B
13 C
12 D
Y9
11
+B
PA4008 (Q6)
AUX L
AUX R
1
4
20
17
2
FUNCTION SWITCH
(LOW LEVEL ACTIVE)
AUX
D2
D3
AM/FM
AM/FM
(TUNER: H)

Fig. 1-10 AUX function selection

TAPE1 : TAPE 1 PLAY switch

The level of pin 25 (PD6010) is inverted (L/H) each time the front panel TAPE 1 button is pressed. When pin 25 is switched to low level, Q15 is turned on and the TAPE 1 indicator lamp comes on. This results in the source channel of the tape play switch (electronic switch with low level active) being turned off, and TAPE 1 channel being turned on.

㉔ STATION CALL SWITCHES

These are pressed to call out preset broadcasting stations or to preset the station.

To call out a station, first set the desired frequency band using the FM or AM switches and then press the desired switch.

㉕ SPEAKERS INDICATORS (A/B)

These light when SPEAKERS switch (A and/or B) has been depressed.

㉖ TONE CONTROL STEP DISPLAY
(𝄢 TONE 𝄞)

This display indicates the level of the frequency response which has been increased or reduced using the TONE CONTROLS by the two symbols, "┏" and "┗" and numbers in 7 steps. " 𝄢 " indicates the bass range while 𝄞 indicates the treble range.

㉗ PRESET-TONE INDICATORS (A/B)

These indicators blink when the frequency response curves are memorized using the PRESET memory function, and they light when the curves are recalled using the PRESET-TONE switches to indicate that the curves have been memorized.

㉘ PRESET-VOLUME INDICATORS (A/B)

These indicators blink when the volume, loudness and muting level are memorized using the PRESET memory function, and light when the level is recalled using the PRESET-VOLUME switches to indicate that the level has been memorized.

㉙ LOUDNESS INDICATOR

This lights when the LOUDNESS switch is depressed. It also lights up to indicate that the loudness level has been memorized using the PRESET memory function.

㉚ MUTING INDICATOR

This lights when the MUTING switch is depressed. It also lights up to indicate that the muting level has been memorized using the PRESET memory function.

㉛ BALANCE INDICATOR

This lights as the BALANCE CONTROLS are operated. The arrows indicate whether the sound tends to be louder at the left or right speaker. When both the L and R arrows light, this indicates that the balance has been set to the center position.

㉜ VOLUME STEP DISPLAY

This display indicates the volume level in 32 steps from 00 to 31 in accordance with the adjustment of the VOLUME controls.

NOTE:
When the power is switched on, the volume step display blinks to indicate the volume level. After blinking, the volume step lights.

㉝ INPUT INDICATORS

These light when the ㉒ INPUT (PHONO or AUX/VIDEO) switch is pressed.

㉞ FM STEREO INDICATOR

This lights when receiving an FM stereo program.

㉟ TAPE MONITOR INDICATOR

This indicates the tape deck which is playing back in accordance with the position selected by the TAPE 1, 2 switches.

㊱ SIGNAL INDICATOR

This indicator lights in sequence from 1 to 3 during the tuning of an AM or FM broadcast in accordance with the strength of the signals being received. The optimum tuning point is where the maximum number of indicators lights.

㊲ TAPE SWITCHES

TAPE 1: Depress this switch to use the tape deck connected to the TAPE 1 jacks (REC and PLAY).

TAPE 2: This is depressed when using a tape deck or adaptor unit connected to the rear panel TAPE 2/ADAPT (Adaptor) jacks.

NOTE:
Depress TAPE 1 and release TAPE 2 when dubbing a tape in the deck connected to the TAPE 1 jacks onto a tape in the deck connected to the TAPE 2/ADPT jacks.

㊳ MEMORY SWITCH

This switch is used to preset stations into the STATION CALL switches. It is also used when presetting the frequency response curves into the PRESET-TONE switches and the volume patterns into the PRESET-VOLUME switches.

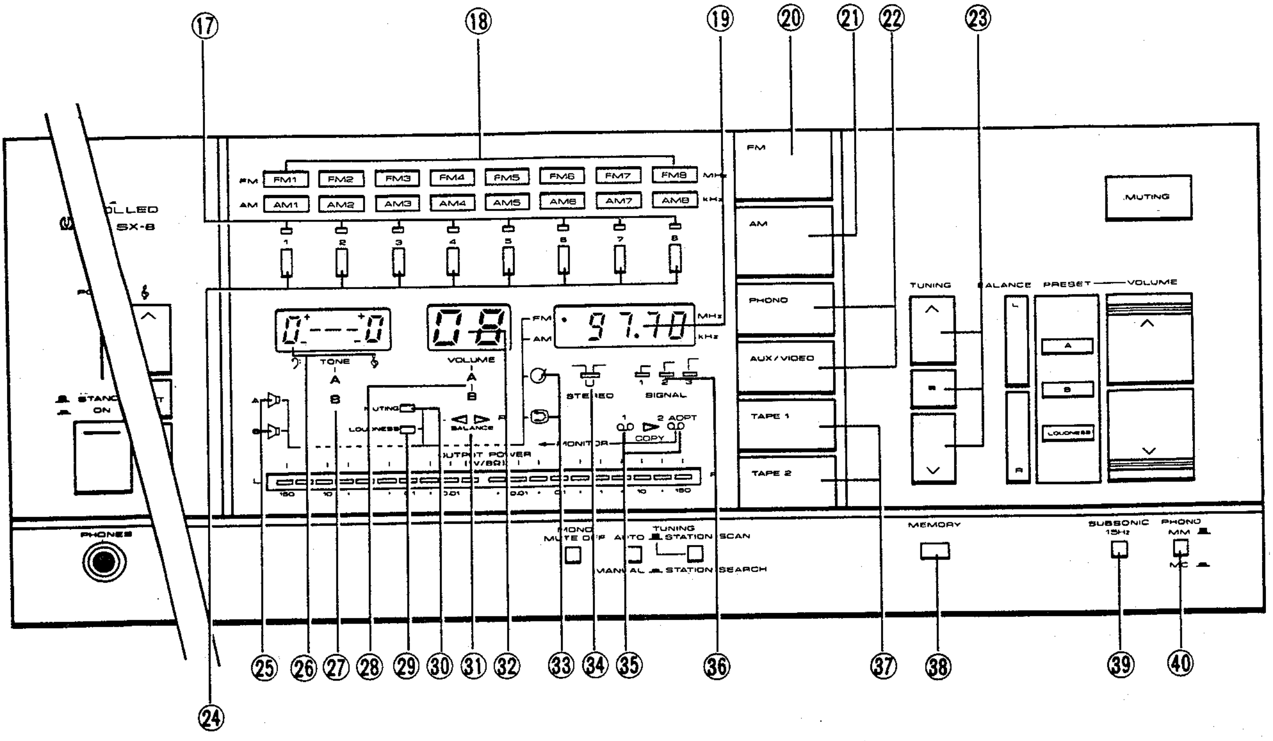
㊴ SUBSONIC 15Hz SWITCH

The subsonic filter with the 15Hz cut-off frequency is actuated when this switch is depressed. This filter serves to attenuate the frequencies lower than 15Hz with a 6dB/oct. slope and, therefore, it can be used to suppress the ultra-low-range noise which is generated by record warp and other factors. This noise cannot actually be heard by the ear but it can cause cross modulation distortion and even speaker damage. Use this switch when required during record play.

㊵ PHONO MM/MC SELECTOR

This selector can be set to the position corresponding to the type of cartridge which you are using for record play.

MM ▄ : For moving magnet cartridges
MC ▂ : For moving coil cartridges


⑰
⑱
⑲
⑳
㉑
㉒
㉓
FM
AM
FM1
FM2
FM3
FM4
FM5
FM6
FM7
FM8
AM1
AM2
AM3
AM4
AM5
AM6
AM7
AM8
MHz
kHz
SX-8
ON
97.70
TONE
A
B
VOLUME
A
B
STEREO
SIGNAL
MUTING
LOUDNESS
BALANCE
OUTPUT POWER
MONITOR
COPY
PHONO
AUX/VIDEO
TAPE 1
TAPE 2
TUNING
BALANCE
PRESET
VOLUME
MUTING
LOUDNESS
PHONES
MONO
MUTE OFF
AUTO
TUNING
STATION SCAN
MANUAL
STATION SEARCH
MEMORY
SUBSONIC
15Hz
PHONO
MM
MC
㉔
㉕
㉖
㉗
㉘
㉙
㉚
㉛
㉜
㉝
㉞
㉟
㊱
㊲
㊳
㊴
㊵

⑰ STATION INDICATORS

The indicator that corresponds to the STATION CALL switch which has been depressed lights.

NOTE:
When presetting a station, all eight indicators light in sequence for about 5 seconds.

⑱ STATION DISPLAY WINDOWS

Insert the frequency cards of the broadcasting stations which have been preset into the STATION CALL switches.

⑲ FREQUENCY/CLOCK DISPLAY

This indicates the broadcasting frequency when a station has been tuned in. When the clock switch is depressed, it indicates the present time.

NOTE:
When the power is switched off, the present time is displayed.

⑳ FM SWITCH

Depress this switch for FM reception.

㉑ AM SWITCH

Depress this switch for AM reception.

㉒ INPUT SELECTOR

PHONO:	Press this switch when playing a record on the turntable connected to the PHONO jacks.
AUX/VIDEO:	Press this switch when listening to an audio component connected to the AUX/VIDEO jacks.

㉓ TUNING CONTROLS

These controls are used to tune in the broadcast stations. Depress the " ∧ " control to tune in a station with a higher frequency than that indicated on the display; depress the " ∨ " control to tune in a station with a lower frequency. The center " ■ " control is used to suspend auto tuning operations using the STATION SEARCH and STATION SCAN functions.

NOTE:
For further details on the tuning, refer to the ⑭ AUTO/MANUAL SELECTOR.

NOTE:
By adjusting the VOLUME controls in combination with the MUTING switch, it is possible to adjust the volume more finely across a very wide range.

⑦ PRESET-VOLUME SWITCHES

Switches A and B can memorize the volume level which you have set to your preference, along with the ㊳ MEMORY switch, at two levels. The volume level is set using the ⑧ VOLUME controls while observing the ㉜ VOLUME STEP display. When the ㊳ MEMORY switch is depressed, the PRESET-VOLUME indicator starts to blink. When PRESET-VOLUME switch A or B is depressed, the set volume level is memorized in the switch. After having completed the memory operation, all you have to do to recall the volume level which you have set is depress switch A or B.

⑧ VOLUME CONTROLS

Use these controls to adjust the output level to the speakers and headphones. Depress the ∧ switch to increase the output level. Depress the ∨ switch to decrease the output level.

⑨ PHONES JACK

Plug the headphones plug into this jack when you want to listen through your stereo headphones.
Release both SPEAKERS switches if you want to listen to the sound through your headphones only.

⑩ SPEAKERS SWITCHES

Depress the switch corresponding to the speakers connected to the SPEAKERS terminals (A and B) on the rear panel. "A" refers to the speakers which have been connected to the SPEAKERS terminals (A and B) on the rear while "B" refers to the speakers which have been connected to the B SPEAKERS terminals.

NOTE:
No sound will be heard through the speakers when both A and B switches are depressed if only one set of speakers has been connected to either A or B SPEAKERS terminals.

⑪ CLOCK SWITCH

The time appears on the ⑲ FREQUENCY/CLOCK display when this switch is depressed. The display changes when the AM or FM switch is depressed. To adjust the present time, keep this switch in the depressed position and adjust using the ㉓ TUNING controls (∧ or ∨).

⑫ OUTPUT POWER METER

This meter allows you to read out the rated power level on the bar display when speakers with a nominal impedance of 8 ohms are connected to the SPEAKERS terminals.

⑬ MONO MUTE OFF SWITCH

The sound is heard in mono when this switch is set to the depressed position. Normally, the switch is kept at the released position. During FM or AM reception, the noise is reduced and reception is made clear. When the station is distant and its signals are weak, depress the switch and tune in the station manually.

⑭ AUTO/MANUAL SELECTOR

This is used to select the reception mode.

AUTO (released position): Auto tuning is selected in accordance with the position selected by the STATION SCAN/STATION SEARCH selector on the right.

MANUAL (depressed position): For manual tuning
Depress the TUNING controls and tune in the station manually. Each time the TUNING controls are depressed, the frequency changes in 100kHz steps during FM reception and in 9kHz or 10kHz steps during AM reception in accordance with the position of the AM CHANNEL STEP switch. When the TUNING controls are kept depressed, the frequency is continuously scanned. Tuning stops when the upper or lower limit of the frequency band is reached.

⑮ STATION SCAN/STATION SEARCH SELECTOR

This is used to select the auto tuning mode when the AUTO/MANUAL selector on the left is at AUTO.

STATION SCAN (released position): When the TUNING controls are depressed, the broadcasting stations start to be scanned and this procedure stops once a station has been picked up. After 5 seconds, the program of that station is heard for about 5 seconds. The tuning operation then resumes and sound is heard in the same way. Each of the station is thus picked up in turn.
When the (㉓ Frequency stop " ■ " switch is depressed once you hear the sound of the desired program, the tuning operation stops and the unit is set to the reception mode.

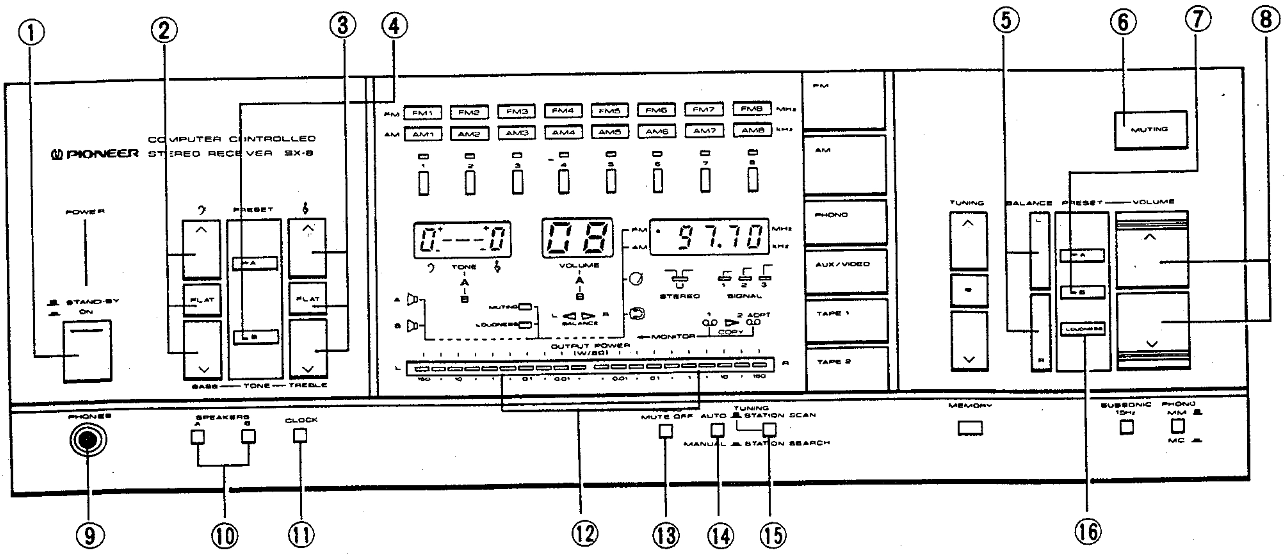
STATION SEARCH (depressed position): When the TUNING controls are depressed, the broadcasting stations start to be scanned, but this operation stops once a station has been picked up and the unit is set to the reception mode. Depress the TUNING controls again if the station picked up is not the one desired. The tuning operation now starts over again.

⑯ LOUDNESS SWITCH

When listening to a performance with the VOLUME level is low, depress this switch and the bass and treble will be accentuated.
When the volume is low, the human ear finds it harder to hear the bass and treble than when the volume is high. The LOUDNESS switch is thus designed to compensate for this deficiency.

(Continued to next page)

2. FRONT PANEL FACILITIES


①
②
③
④
⑤
⑥
⑦
⑧
PIONEER
COMPUTER CONTROLLED STEREO RECEIVER SX-8
POWER
STAND-BY
ON
PRESET
FLAT
BASS — TONE — TREBLE
FM1 FM2 FM3 FM4 FM5 FM6 FM7 FM8
AM1 AM2 AM3 AM4 AM5 AM6 AM7 AM8
TONE
VOLUME
STEREO
SIGNAL
MUTING
LOUDNESS
BALANCE
MONITOR
COPY
OUTPUT POWER (W/8Ω)
FM
AM
PHONO
AUX/VIDEO
TAPE 1
TAPE 2
TUNING
BALANCE
PRESET
VOLUME
MUTING
PHONES
SPEAKERS
A B
CLOCK
MUTE OFF
AUTO STATION SCAN
MANUAL STATION SEARCH
MEMORY
SUBSONIC 15Hz
PHONO MM MC
⑨
⑩
⑪
⑫
⑬
⑭
⑮
⑯

① POWER SWITCH (STAND-BY ■, ON ▬)

When this switch is set to the ON (depressed) position, power is supplied to all the circuits. When set to the STAND-BY position, the power to the main circuits is cut off but still supplied to the clock. The clock continues to function until the power cord is disconnected.

NOTES:

- *Immediately after the power switch has been set to ON, the protection circuit is activated and no sound is heard through the speakers. The VOLUME STEP display blinks at the volume level heard before as a warning. When the numbers of the two digits blink, the output can be expected to be high. In this case, depress the VOLUME control " V " and reduce the numerical display.*
- *Even when the power cord has been disconnected, the STATION CALL switch, PRESET-VOLUME and PRESET-TONE presetting information in the memory is preserved for about one week.*
  When the presetting information has been erased from the memory, follow the relevant instructions and proceed with presetting again.

② BASS TONE CONTROLS

These controls are used to adjust the bass level to your preference. To enhance the bass response, depress the " Λ " control; to attenuate the response, depress " V ". The increase or reduction in the bass response can be monitored on the ㉖ TONE CONTROL STEP display 𝄢. The response itself can be varied in 7 steps in either the "+" or "−" direction. When the center FLAT control is depressed, the bass frequency response is made flat.

③ TREBLE TONE CONTROLS

These controls are used to adjust the treble level to your preference. To enhance the treble response, depress the " Λ " control; to attenuate the response, depress " V ". The increase or reduction in the treble response can be monitored on the ㉖ TONE CONTROL STEP display 𝄞. The response itself can be varied in 7 steps in either the "+" or "−" direction. When the center FLAT control is depressed, the treble frequency response is made flat.

④ PRESET-TONE SWITCHES

Switches A and B can memorize the bass and treble frequency responses which you have set to your preference, along with the ㊳ MEMORY switch, in two patterns (A and B). The bass and treble levels are set using the ② and ③ TONE controls while observing the ㉖ TONE CONTROL STEP display. When the ㊳ MEMORY switch is depressed, the ㉗ PRESET-TONE indicator starts to blink. When PRESET-TONE switch A or B is depressed, the set frequency response pattern is memorized in the switch. After having completed the memory operation, all you have to do to recall the frequency response which you have set is depress switch A or B.

⑤ BALANCE CONTROLS

These controls are used to adjust the balance in the volume of sound heard through the left and right speakers. When the sound tends to be louder at the left speaker, depress the R control; when it tends to be louder at the right speaker, depress the L control. When no sound is being delivered through the speakers, the balance can be checked by the ㉛ BALANCE indicators (L ◁ or ▷ R). Normally, both controls are depressed simultaneously and set to the center position (L ◁ and ▷ R light).

⑥ MUTING SWITCH

Depress this switch to attenuate the audio output indicated on the ㉜ VOLUME STEP display by 25dB. There is no need to adjust the VOLUME level when turning down the audio output temporarily and when changing over records or tapes.

1. SPECIFICATIONS

Power Amplifier Section

Continuous Average Power Output is 100 watts* per channel, min., at 8 ohms from 20 Hertz to 20,000 Hertz with no more than 0.005% total harmonic distortion.

Total Harmonic Distortion (20 Hertz to 20,000 Hertz, 8 ohms)
continuous rated power output: No more than 0.005%
50 watts per channel power output
.... No more than 0.005%
Intermodulation Distortion (50 Hertz : 7,000 Hertz = 4:1)
continuous rated power output
.... No more than 0.005%
50 watts per channel power output
.... No more than 0.005%
Frequency Response . . . 5 Hertz to 450,000 Hertz $^{+0}_{-3}$ dB
Input Sensitivity/Impedance (POWER AMP IN)
.... 1V/50 kilohms
Output: Speaker .... A, B, A series B
Damping Factor (20 Hertz to 20,000 Hertz, 8 ohms): 50
Hum and Noise (IHF, short-circuited, A network): 115dB

Preamplifier Section

Input (Sensitivity/Impedance)
PHONO MM .... 2.5mV/50 kilohms
PHONO MC .... 0.25mV/100 ohms
AUX/VIDEO, TAPE PLAY 1, 2/ADAPTOR IN
.... 150mV/50 kilohms
Phono Overload Level (T.H.D. 0.009%, 1,000 Hertz)
PHONO MM 150mV
Output (Level/Impedance)
TAPE REC 1, 2/ADAPTOR OUT : 150mV/2.2 kilohms
PREAMP OUT (R_L : 50 kilohms)
.... rated 1V/1 kilohms
Frequency Response
PHONO (RIAA Equalization)
.... 20Hz to 20,000 Hertz±0.3dB
AUX, TAPE PLAY 1, 2/ADAPTOR IN
.... 5Hz to 100,000 Hertz $^{+0}_{-3}$ dB
Tone Control
BASS .... ±10dB (100Hz)
TREBLE .... ±10dB (10kHz)
Subsonic Filter 15Hz (6dB/oct.)
Loudness Contour (Volume control set at
–40dB position) . . . . +6dB (100Hz), +3dB (10,000Hz)
Hum and Noise (IHF, short-circuited, A network)
PHONO MM/MC 80dB/67dB
Muting .... –25dB

FM Tuner Section

Usable Sensitivity (IHF) . . . . . . 10.3dBf (0.9μV, 75 ohms)
50dB Quieting Sensitivity
MONO .... 15.7dBf (1.6μV, 75 ohms)
STEREO .... 37dBf (19.5μV, 75 ohms)
Signal-to Noise Ratio
MONO .... 80dB (at 85dBf)
STEREO .... 76dB (at 85dBf)
Distortion (at 65dBf)
MONO 100Hz 0.1%
1kHz 0.07%
6kHz 0.15%
STEREO 100Hz 0.15%
1kHz 0.1%
6kHz 0.2%
Capture Ratio 1.0dB
Alternate Channel Selectivity
400kHz 80dB
Stereo Separation
1kHz 45dB
30Hz to 15kHz 35dB
Frequency Response .... 20Hz to 15kHz±0.5dB
Spurious Response Ratio 90dB
Image Response Ratio 80dB
IF Response Ratio 90dB
AM Suppression Ratio 55dB
Subcarrier Product Ratio 55dB
SCA Rejection Ratio 60dB
Muting Threshold 29.3dBf (8μV)
Antenna Input
.... 300 ohms balanced, 75 ohms unbalanced

AM Tuner Section

Sensitivity (IHF, Ferrite antenna) 300μV/m
(IHF, Ext. antenna) 15μV
Selectivity 27dB
Signal-to-Noise Ratio 50dB
Image Response Ratio 40dB
IF Response Ratio 80dB
Antenna .... Ferrite loopstick antenna

Miscellaneous

Power Requirements .... AC 120V, 60Hz
Power Consumption .... 295W (UL)
Dimensions .... 420(W) x 151(H) x 448(D) mm
16-9/16(W) x 5-15/16(H) x 17-5/8(D) in
Weight (without package) .... 15 kg (33 lb 1 oz)

Furnished Parts

Operating instructions 1
FM T-type antenna 1
Station Card 2

**Measured pursuant to the Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifiers.*

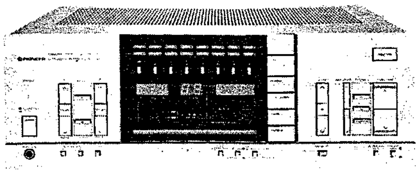
NOTE:
Specifications and the design subject to possible modifications without notice due to improvements.

2772

PIONEER

Service Manual

REPAIR & ADJUSTMENTS



ORDER NO.
ARP-043-0

COMPUTER CONTROLLED STEREO RECEIVER

SX-8

05. März 1982
gebucht

MODEL SX-8 COMES IN FOUR VERSIONS DISTIGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KU	AC 120V only	U.S.A. model
S	AC 110V, 120V, 220V and 240V (Switchable)	General export model
S/G	AC 110V, 120V, 220V and 240V (Switchable)	U.S. Military model
KC	AC 120V only	Canada model

- **This service manual is applicable to the KU type. When repairing the S and S/G types, please see the additional service manual (pp.45–52).**
- **For the circuit description, please refer to the model SX-9 service manual (ARP-088).**
- **Ce manuel d'instruction se refère au mode de réglage, en français.**
- **Este manual de servicio trata del método de ajuste escrito en español.**

CONTENTS

1. SPECIFICATIONS 2
2. FRONT PANEL FACILITIES 3
3. PARTS LOCATION 7
4. BLOCK DIAGRAM 9
5. P.C.BOARDS CONNECTION DIAGRAM 11
6. SCHEMATIC DIAGRAM 18
7. ELECTRICAL PARTS LIST 25
8. PACKING 30
9. EXPLODED VIEW 31
10. ADJUSTMENTS 36
RÉGLAGE 39
AJUSTE 42
ADDITIONAL SERVICE MANUAL FOR S AND S/G TYPES 45

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
U.S. PIONEER ELECTRONICS CORPORATION 85 Oxford Drive, Moonachie, New Jersey 07074, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Luithagen-Haven 9, 2030 Antwerp, Belgium
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FH © JAN. 1982 Printed in Japan

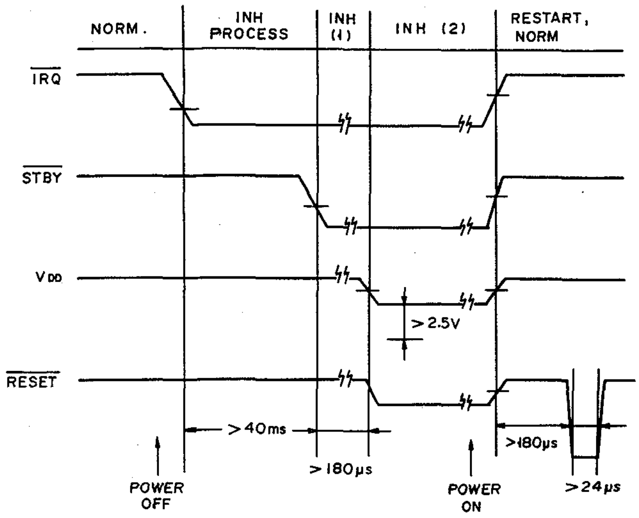

NORM.
INH PROCESS
INH (1)
INH (2)
RESTART, NORM
$\overline{IRQ}$
$\overline{STBY}$
V_{DD}
$\overline{RESET}$
> 2.5V
> 40ms
> 180μs
>180μs
> 24μs
POWER OFF
POWER ON

Fig. 1-33 Power supply sequence for stop/restart

Sound Indicator (SX-9)

PD6011 generates a 2kHz (approx.) square wave output for 50ms at pin 34 for each key input operation. Furthermore, PD6010 gives PD6011 the command for generating the output. When the front panel sound indicator switch is turned on, the output signal is amplified to drive a piezoelectric ceramic transducer buzzer.

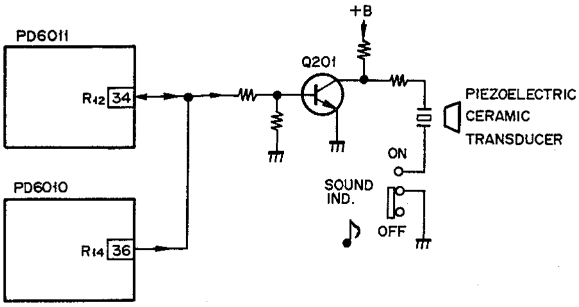


Fig. 1-31 Sound indicator circuit

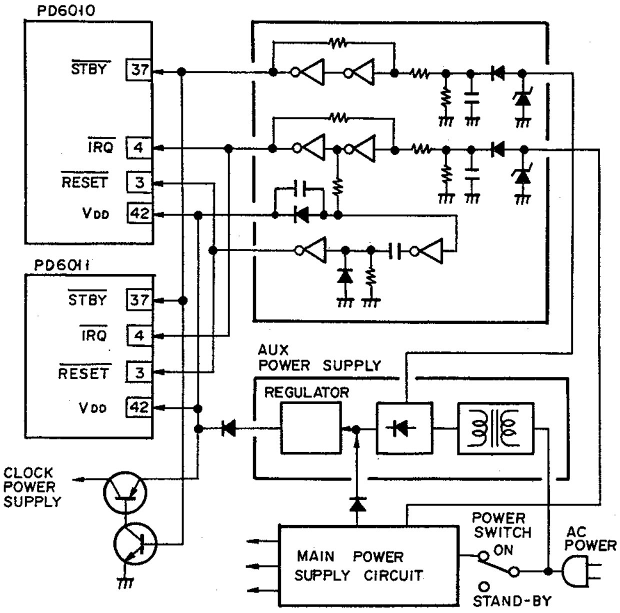


Fig. 1-32 Microcomputers control circuit

Microcomputer Operation Control

The microcomputers (PD6010 and PD6011) in the SX-9 are powered by a back-up power supply when the POWER switch is off (STAND-BY position). PD6010 and PD6011 operation is controlled by three signals ($\overline{\text{IRQ}}$, $\overline{\text{STBY}}$, and $\overline{\text{RESET}}$).

$\overline{\text{IRQ}}$ is connected to the main power line, and is set to low level when the power switch is in the STAND-BY position.

With $\overline{\text{IRQ}}$ at low level, PD6010 sets P2, P3, O0 ~ O3, R1, and R4 ~ R14 to low level and R0, R2 and R3 to high level after 612μs. After 31 to 35ms, O4 ~ O7 are all changed to low level (P0 and P1 can be either low or high level). In this condition, only the clock function is maintained, all other functions being arrested.

PD6011 (with $\overline{\text{IRQ}}$ at low level) sets P0 ~ P3, O0 ~ O7, and R11 ~ R15 to low level and R0, R1, R9 and R10 to high level after 480μs. And after about 35ms, R2 ~ R8 are all changed to low level, thereby arresting all PD6011 operations.

$\overline{\text{STBY}}$ is connected to the back-up power supply, and when the external AC mains is switched off, this too is dropped to low level. All PD6010 and PD6011 operations are thereby stopped, and the supply of clock pulses to the EXtal pin consequently halted. In this condition, PD6010 and PD6011 can preserve the internal memories by as little current as 10μA (2.5V min). In the SX-9, this current is supplied from the residual current on a power circuit capacitor. The memories can be preserved for up to two weeks.

Microcomputer functions are restarted by the $\overline{\text{RESET}}$ signal when the power is switched back on. This $\overline{\text{RESET}}$ signal is a negative pulse generated by the rising edge of $\overline{\text{IRQ}}$. PD6010 and PD6011 are initialized when the $\overline{\text{RESET}}$ pin is changed to low level, and the memories are checked by dummy data (generated by the trailing edge of $\overline{\text{IRQ}}$), thereby providing the required output data. If the result of the memory check indicates abnormal status, PD6011 sets VOLUME to 0 and TONE to flat, and PD6010 sets BALANCE to center, FUNCTION to FM, TAPE PLAY to OFF, the time to 1:00, and clears the preset memories. The power supply sequence for stop/start is shown in Fig. 1-33.

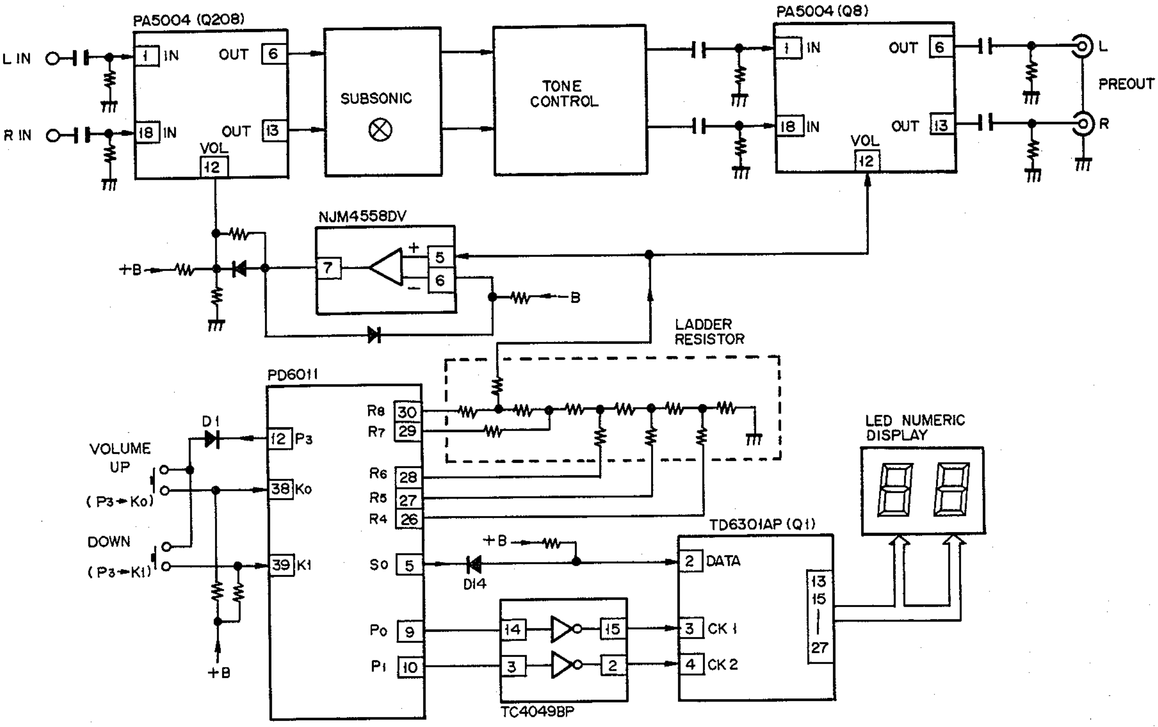

PA5004 (Q208)
L IN
R IN
1 IN
OUT 6
18 IN
OUT 13
VOL
12
SUBSONIC
TONE CONTROL
PA5004 (Q8)
PREOUT
L
R
NJM4558DV
+B
-B
LADDER RESISTOR
PD6011
D1
VOLUME UP
(P3→K0)
DOWN
(P3→K1)
12 P3
38 K0
39 K1
R8 30
R7 29
R6 28
R5 27
R4 26
S0 5
P0 9
P1 10
D14
LED NUMERIC DISPLAY
TD6301AP (Q1)
2 DATA
3 CK1
4 CK2
TC4049BP

Fig. 1-29 Volume control keys

VOL-A & B : Volume control preset switches

When the front panel VOLUME A or B button is pressed, the corresponding memory address is designated, and the volume control data stored in that memory is read out. The volume control position (step 0 to 31) is thus set immediately and shown in the VOLUME display. At the same time, a VOLUME preset indicator control signal output from PD6011 activates the indicator (A or B) corresponding to that memory. If the designated memory is blank, however, there is no change to the current volume control setting. And if the memory is in write enable status (the 5 second interval following pressing of the MEMORY button, and indicated by the VOLUME preset indicator lamps blinking on and off), the VOLUME control position data at that time will be stored in the designated memory. Note that the status of the MUTING switch (−25dB) can also be stored in this way.

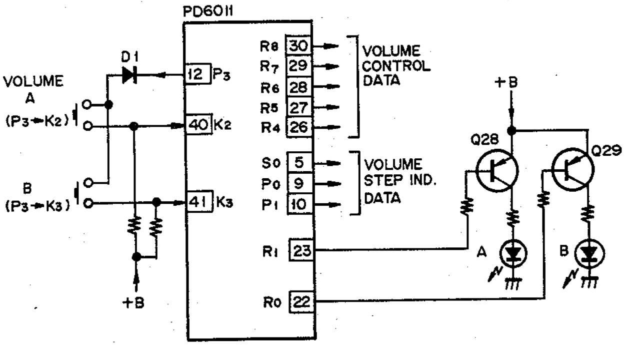

PD6011
D1
VOLUME A
(P3→K2)
B
(P3→K3)
12 P3
40 K2
41 K3
+B
R8 30
R7 29
R6 28
R5 27
R4 26
VOLUME CONTROL DATA
S0 5
P0 9
P1 10
VOLUME STEP IND. DATA
R1 23
R0 22
Q28
Q29
A
B

Fig. 1-30 Preset of volume control levels

BASS DOWN : Bass step down switch

When the front panel BASS DOWN button is pressed, the bass frequency response of the tone control circuit is dropped down by one step. The TONE display is changed by a corresponding amount. If the button is depressed for more than 0.4 second, the frequency response is dropped down continuously.

BASS FLAT : Bass flat switch

When the front panel BASS FLAT button is pressed, the low end of the tone control circuit frequency response is made flat (and "0" is shown in the TONE display).

BASS UP : Bass step up switch

When the front panel BASS UP button is pressed, the bass frequency response of the tone control circuit is raised by one step. The TONE display is again changed by a corresponding amount. If the button is pressed for more than 0.4 second, the frequency response is raised continuously.

TREBLE DOWN : Treble step down switch

When the front panel TREBLE DOWN button is pressed, the treble frequency response of the tone control circuit is dropped by one step. The TONE display is also changed by a corresponding amount. If the button is pressed for more than 0.4 second, the frequency response is dropped continuously.

TREBLE FLAT : Treble flat switch

When the front panel TREBLE FLAT button is pressed, the high end of the tone control circuit frequency response is made flat (and "0" is shown in the relevant position in the TONE display).

TREBLE UP : Treble step up switch

When the front panel TREBLE UP button is pressed, the treble frequency response of the tone control circuit is raised by one step. The TONE display is also changed by a corresponding amount. When the button is pressed for more than 0.4 second, the frequency response is changed continuously.

TONE-A, B, and C : Tone control preset switches

When the front panel TONE-A, B, or C button is pressed, the corresponding memory address is designated, and the tone control data stored in that memory is read out. The frequency response of the tone control circuit (variable in 15 steps for both bass and treble) is thus specified, and is also shown in the TONE display. At the same time, 2-bit display data from PD6011 activates the TONE preset indicator corresponding to the designated memory.

If the designated memory is blank, there is no change in the tone control circuit frequency response. And if the memory is in write enable status (the 5 second interval following pressing of the MEMORY button, and indicated by the TONE preset indicator lamps blinking on and off), the frequency response setting of the tone control circuit at that time will be stored in the specified memory.

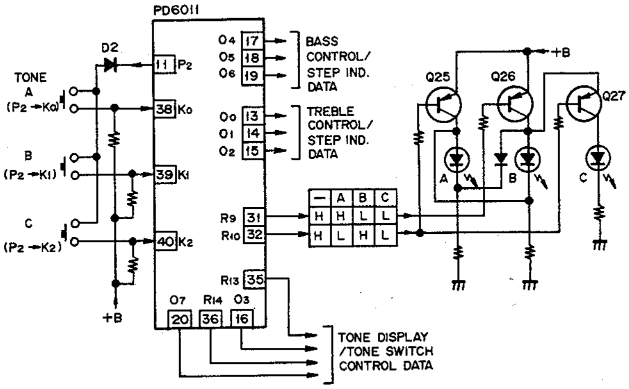


Fig. 1-28 Preset of tone control responses

VOL-UP, DOWN : Volume control switches

Volume control of the audio signal circuit is handled by VCA ICs (PA5004) position before and after the tone control stage. By changing the DC voltage on pin 12 from 0 to 3.2V, PA5004 varies the gain from −90dB to 0dB. The volume control output signal from PD6011 is in 5-bit binary code (covering 32 steps from 0 to 31). This output is converted from digital to anlog by the R-2R ladder resistor, and voltage fluctuations then compensated to obtain the volume control voltage.

The volume level is increased or decreased one step at a time each time the front panel VOLUME UP or DOWN button is pressed. The rate of volume level change when these button remain depressed varies. When the VOLUME UP button remains depressed, the volume is increased at rates of 0.2 to 0.4 second per step when the VOLUME display is in the 0 to 8 range, and at a rate of 0.4 second per step in the 8 to 31 range. When the VOLUME DOWN button is pressed, the volume is decreased at a rate of 0.15 second per step. VOLUME display data is obtained by passing binary code data from PD6011 to TD6301AP where it is converted to 7-segment decimal data used to drive the LED numeric display (2-digit display).

When treble is flat, pins 16 and 35 of PD6011 are both at high level and Q36 and Q37 are turned on. The TREBLE FLAT indicator lamp thus comes on, and the treble cut and treble boost circuits are turned off. The high end of the source signal is, therefore, neither boosted nor attenuated.

When treble is attenuated, pin 16 of PD6011 is changed to low level and Q30 is turned on. The TREBLE CUT indicator thus comes on and the treble cut ciruit is connected. The treble level is controlled in PA5004, the treble level of the treble cut signal being changed in 7 steps according to 3-bit data from PD6011. The treble cut signal is then subtracted from the source signal to obtain the required treble attenuated frequency response. At the same time, the 3-bit BCD code signal is also converted to 7-segment decimal data by TC5022BP for display of the degree of attenuation (steps 1 to 7).

When treble is boosted, pin 35 of PD6011 is switched to low level and Q32 turned on. The TREBLE BOOST indicator lamp thus comes on and the treble boost circuit is connected. PA5004 varies the treble boost signal level in 7 steps in the same way as when treble is attenuated, and adds the signal to the source signal to obtain the treble boosted frequency response.

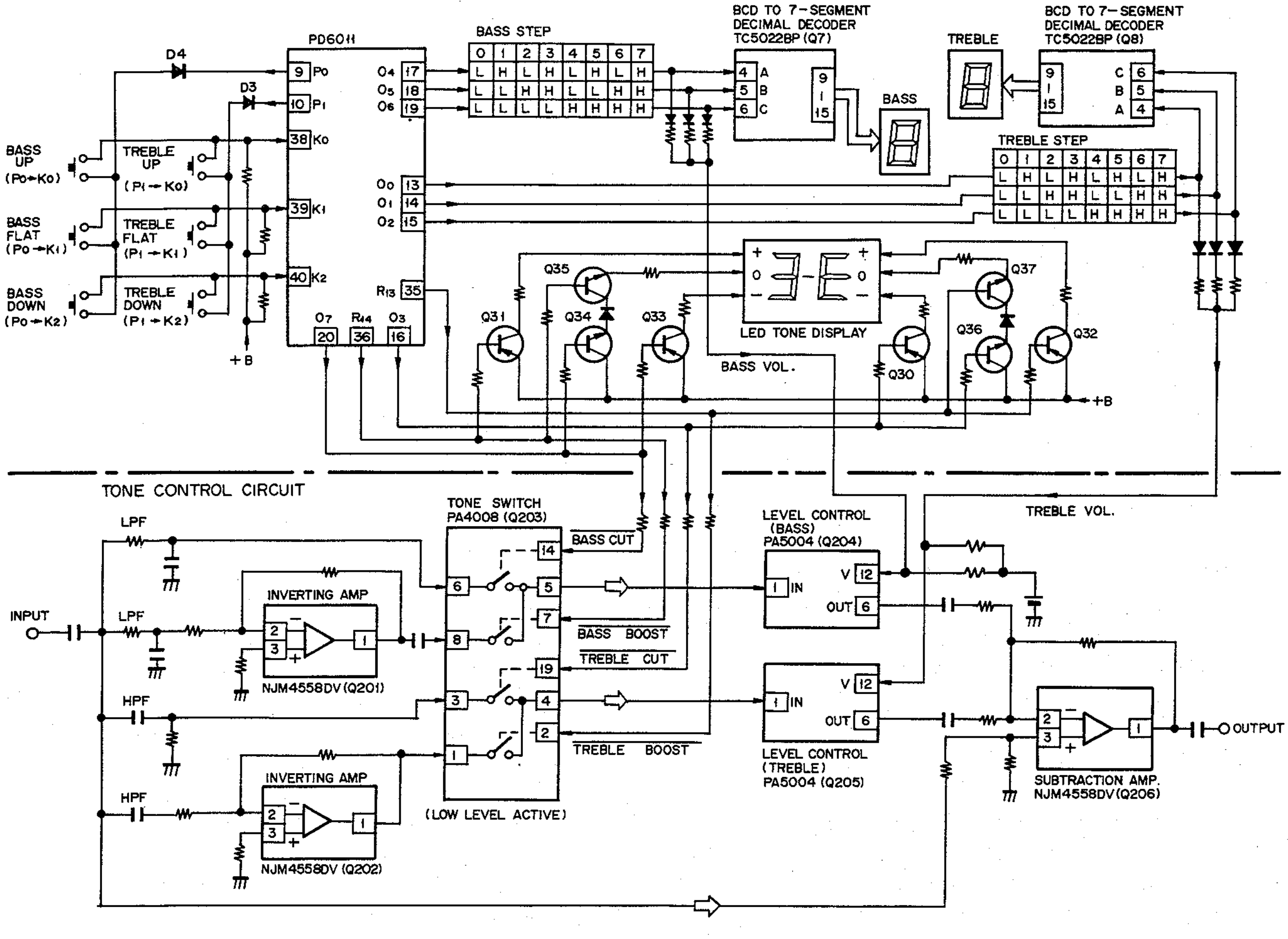

PD6011
D4
D3
9 P0
10 P1
38 K0
39 K1
40 K2
O4 17
O5 18
O6 19
O0 13
O1 14
O2 15
R13 35
O7 20
R14 36
O3 16
BASS UP (P0→K0)
TREBLE UP (P1→K0)
BASS FLAT (P0→K1)
TREBLE FLAT (P1→K1)
BASS DOWN (P0→K2)
TREBLE DOWN (P1→K2)
+B
BASS STEP
BCD TO 7-SEGMENT DECIMAL DECODER TC5022BP (Q7)
BASS
TREBLE
BCD TO 7-SEGMENT DECIMAL DECODER TC5022BP (Q8)
TREBLE STEP
Q35
Q31
Q34
Q33
Q37
Q36
Q30
Q32
LED TONE DISPLAY
BASS VOL.
TREBLE VOL.
TONE CONTROL CIRCUIT
LPF
HPF
INPUT
INVERTING AMP
NJM4558DV (Q201)
NJM4558DV (Q202)
TONE SWITCH PA4008 (Q203)
BASS CUT
BASS BOOST
TREBLE CUT
TREBLE BOOST
(LOW LEVEL ACTIVE)
LEVEL CONTROL (BASS) PA5004 (Q204)
LEVEL CONTROL (TREBLE) PA5004 (Q205)
IN
OUT
V
SUBTRACTION AMP. NJM4558DV (Q206)
OUTPUT

Fig. 1-27 Tone control circuit

AUDIO MUTE : Audio muting switch

The muting function for the audio signal circuit is also incorporated in the VCA IC (PA5004). When pin 11 of this IC is changed to low level, audio muting of about −25dB is applied.

The level of pin 24 of PD6011 is inverted (L/H) each time the front panel MUTING button is pressed. And when pin 24 is at low level, Q24 is turned on, resulting in the MUTING indicator coming on and the audio muting being applied.

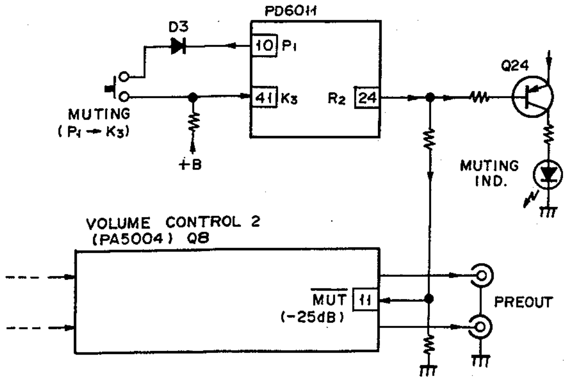


Fig. 1-25 MUTING switch

● Tone control circuit operation

The operating principles of the SX-9 tone control circuit are outlined in Fig. 1-26.

For bass cut, the level of the signal passed via a LPF (low-pass filter) is adjusted and subtracted from the source signal to obtain the required attenuated bass frequency response. For bass boost, the signal passed via the LPF is inverted and amplified, the level adjusted and added to the source signal to obtain the required boosted bass frequency response. Likewise for treble, the signal passed via a HPF (high-pass filter) is similarly processed to obtain the required frequency responses.

The actual circuit features an electronic switch IC (PA4008) for the boost and cut switching. Levels are adjusted in the VCA IC (PA5004), and the operation is controlled by microcomputer (PD6011). (See Fig. 1-27).

The bass level control (PA5004) involves digital/analog conversion of the 3-bit BCD code output from pins 17 to 19 of PD6011. Treble is likewise controlled by outputs from pins 13 to 15 of PD6011.

When bass is flat, pins 20 and 36 are both at high level, resulting in Q34 and Q35 being turned on. The BASS FLAT indicator thus comes on, and the bass cut and boost circuits are switched off by electronic switch (PA4008). The source signal is, therefore, neither boosted nor attenuated.

When bass is attenuated, pin 20 of PD6011 is switched to low level, resulting in Q33 being turned on and the BASS CUT indicator coming on with the bass cut circuit being connected. Bass level is controlled in PA5004, the bass cut signal level being changed in 7 steps according to the 3-bit data output from PD6011. The bass cut signal is then subtracted from the source signal to obtain the required bass attenuated frequency response. At the same time, the 3-bit BCD code data is converted into 7-segment decimal data by TC5022BP for display of the degree of attenuation (steps 1 to 7).

When bass is boosted, pin 36 of PD6011 is switched to low level and Q31 is turned on. The BASS BOOST indicator lamp thus comes on and the bass boost circuit is connected. PA5004 also changes the level of the bass boost signal in 7 steps, and adds the bass boost signal to the source signal to obtain the required bass boosted frequency response.

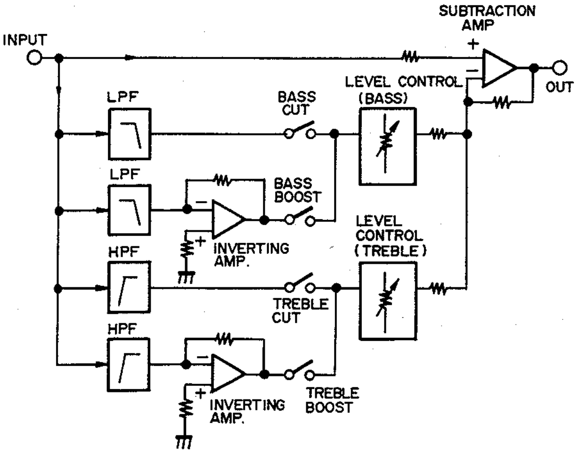


Fig. 1-26 Basic circuitry of tone control

button (P3 → R9), the contents of the STATION 1 ~ 8 preset memories are cleared.

PD6011 Key Matrix Description

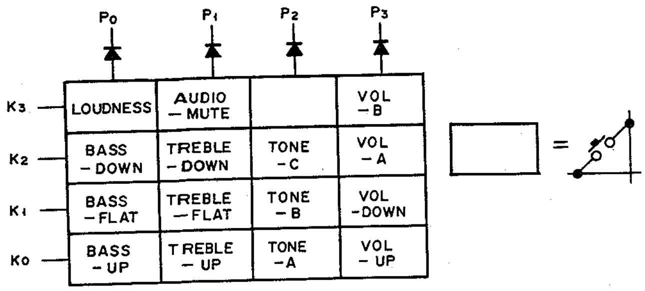

P0
P1
P2
P3
K3
K2
K1
K0
LOUDNESS
AUDIO – MUTE
VOL – B
BASS – DOWN
TREBLE – DOWN
TONE – C
VOL – A
BASS – FLAT
TREBLE – FLAT
TONE – B
VOL – DOWN
BASS – UP
TREBLE – UP
TONE – A
VOL – UP
=

Fig. 1-22 Input key matrix for PD6011

LOUDNESS : Loudness contour switch

The loudness contour function of the audio signal circuit is incorporated in the VCA IC (PA5004). This loudness function is determined by a twin T-shaped filter connected between pin 3 (16) and pin 5 (14), and is activated when pin 7 of PA5004 is changed to low level.

Pin 25 of PD6011 is inverted (L/H) each time the front panel LOUDNESS button is pressed. Q23 is turned on when pin 25 is changed to low level, resulting in the LOUDNESS indicator lamp coming on and the loudness function being activated.

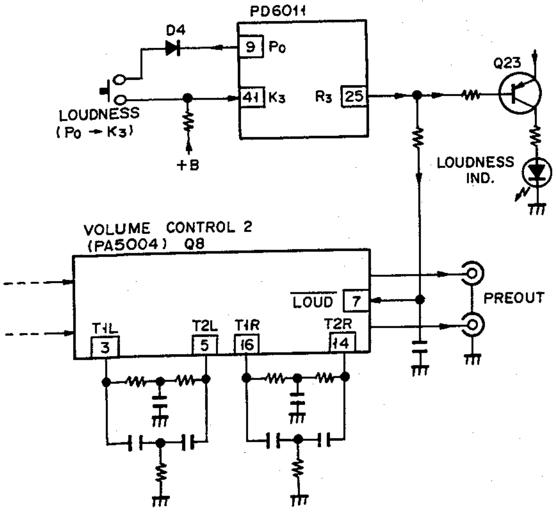

PD6011
D4
9 P0
41 K3
R3 25
Q23
LOUDNESS
(P0 → K3)
+B
LOUDNESS IND.
VOLUME CONTROL 2
(PA5004) Q8
LOUD 7
PREOUT
T1L 3
T2L 5
T1R 16
T2R 14

Fig. 1-24 LOUDNESS contour switch

PD6011

Pin No.	Symbol	Description								
1	EXtal	Clock pulse input (500 kHz)								
2	Xtal	Oscillator output (open)								
3	$\overline{RESET}$	Reset input (effective low)								
4	$\overline{IRQ}$	Inhibit mode control 1								
5	SO	Volume step indicator data out								
6	SI	(ground)								
7	$\overline{SC/TO}$	(open)								
8	$\overline{TC}$	(ground)								
9	P0	CK1	Data transfer clock output							
10	P1	CK2								
11	P2	Key scan clock output								
12	P3									
13	O0	TREBLE control data output								
14	O1									
15	O2									
16	O3	Treble cut output								
17	O4	BASS control data output								
18	O5									
19	O6									
20	O7	Bass cut output								
21	VSS	(ground)								
22	R0	B	VOLUME preset indicator out							
23	R1	A								
24	R2	MUTING indicator output								
25	R3	LOUDNESS indicator output								
26	R4	VOLUME control data output								
27	R5									
28	R6									
29	R7									
30	R8									
31	R9	TONE preset indicator out	O	H	A	H	B	L	C	L
32	R10			H		L		H		L
33	R11	Connect to PD6010 (R1)								
34	R12	Sound indicator output (2 kHz/50 ms)								
35	R13	Treble boost output								
36	R14	Bass boost output								
37	$\overline{STBY}$	Inhibit mode control 2								
38	K0	Key input								
39	K1									
40	K2									
41	K3									
42	VDD	+5V power source								

Fig. 1-23 Pin description for PD6011

F–UP, F–DOWN: Frequency tuning switches

When the tuning mode is MANUAL, and the front panel TUNING UP or DOWN button is pressed, the tuned frequency is increased or decreased correspondingly by a single step. (50kHz per step for FM in the S and S/G types and 100kHz per step in the KU and KC types, and 9kHz or 10kHz per step for AM depending on the selector switch). The frequency is changed continuously if either button is depressed for more than 0.4 seconds, and stopped again as soon as the button is released. Frequency scanning stops when the band edge is reached.

When the UP or DOWN button is pressed during AUTO tuning mode, the tuned frequency is increased or decreased by frequency scanning. When the band edge is reached, the scanning simply continues from the reverse band edge.

If scanning is stopped by the IF–STOP key (P3 → K3) after tuning to a broadcast station in STATION SCAN tuning mode, the memory is put into write enable status for a 5 second interval (and the STATION indicator blinks on and off). If a memory address is designated by STATION CALL button during this interval, the tuned frequency will stored in that memory, and the frequency scanning operation subsequently resumed. If, however, no memory address is designation, frequency scanning recommences after 5 seconds.

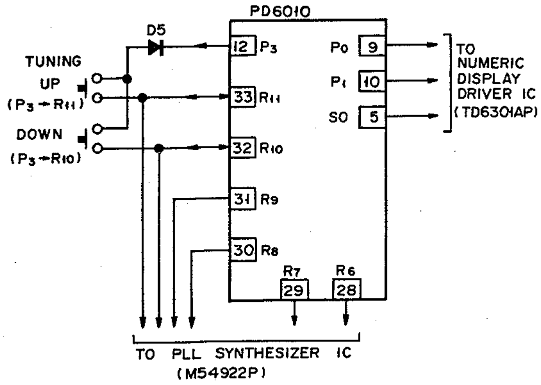

PD6010
D5
TUNING
UP
(P3→R11)
DOWN
(P3→R10)
12 P3
33 R11
32 R10
31 R9
30 R8
R7 29
R6 28
P0 9
P1 10
SO 5
TO NUMERIC DISPLAY DRIVER IC (TD6301AP)
TO PLL SYNTHESIZER IC (M54922P)

Fig. 1-19 Tuning control keys

Time is adjusted by pressing the TUNING UP or DOWN button while depressing the CLOCK button (P1 → R8).

MEMO : Memory switch

Memory write enable status is activated for approximately 5 seconds when the front panel MEMORY button is pressed. During this interval, all of the preset indicator lamps (STATION 1 ~ 8, VOLUME A & B, and TONE A, B & C) blink on and off. This status is cancelled after the elapse of 5 seconds, or when a relevant key is pressed.

Q19 is turned on and off by an output from pin 35 of PD6010 in order to make the indicators for stored memories brighter, and the indicators for blank memories dimmer.

F–STOP : Frequency scanning stop switch

Frequency scanning is stopped by pressing the front panel TUNING STOP button when frequencies are being scanned in AUTO tuning mode. And if pressed together with the MEMORY

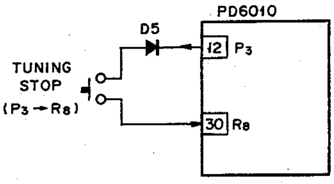

PD6010
D5
TUNING
STOP
(P3→R8)
12 P3
30 R8

Fig. 1-21 Frequency scan stop switch

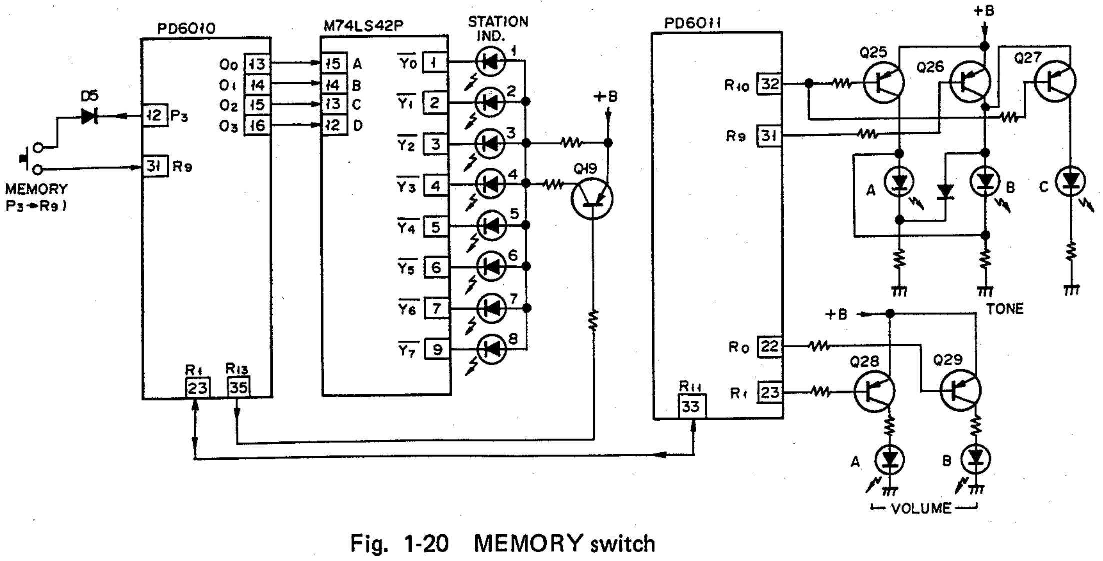
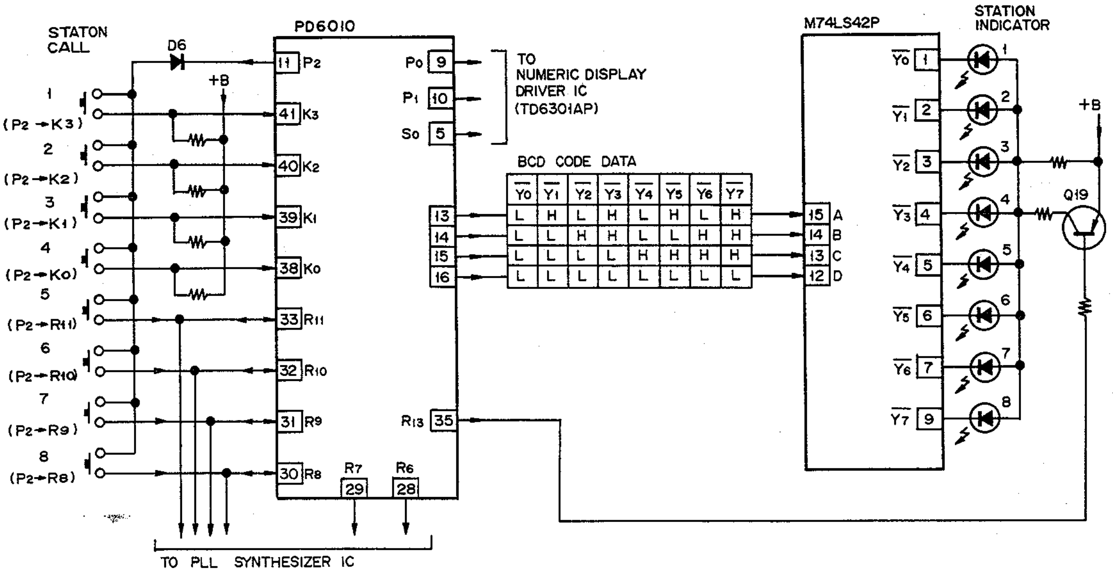

PD6010
M74LS42P
STATION IND.
PD6011
D5
MEMORY
(P3→R9)
12 P3
31 R9
O0 13
O1 14
O2 15
O3 16
R1 23
R13 35
15 A
14 B
13 C
12 D
Y0 1
Y1 2
Y2 3
Y3 4
Y4 5
Y5 6
Y6 7
Y7 9
1
2
3
4
5
6
7
8
+B
Q19
R10 32
R9 31
R0 22
R1 23
R11 33
Q25
Q26
Q27
A
B
C
TONE
Q28
Q29
A
B
VOLUME

Fig. 1-20 MEMORY switch


STATON CALL
D6
+B
1
(P2→K3)
2
(P2→K2)
3
(P2→K1)
4
(P2→K0)
5
(P2→R11)
6
(P2→R10)
7
(P2→R9)
8
(P2→R8)
PD6010
11 P2
41 K3
40 K2
39 K1
38 K0
33 R11
32 R10
31 R9
30 R8
R7 29
R6 28
P0 9
P1 10
S0 5
13
14
15
16
R13 35
TO NUMERIC DISPLAY DRIVER IC (TD6301AP)
BCD CODE DATA
M74LS42P
15 A
14 B
13 C
12 D
Y0 1
Y1 2
Y2 3
Y3 4
Y4 5
Y5 6
Y6 7
Y7 9
STATION INDICATOR
1
2
3
4
5
6
7
8
+B
Q19
TO PLL SYNTHESIZER IC (M54922P)

$\overline{Y0}$	$\overline{Y1}$	$\overline{Y2}$	$\overline{Y3}$	$\overline{Y4}$	$\overline{Y5}$	$\overline{Y6}$	$\overline{Y7}$
L	H	L	H	L	H	L	H
L	L	H	H	L	L	H	H
L	L	L	L	H	H	H	H
L	L	L	L	L	L	L	L

Fig. 1-16 Preset of broadcasting stations

BAL-L, R : Balance control switches

The left and right channel balance control function of the audio signal circuit is incorporated in the VCA IC (PD5004), and is controlled by the DC voltage on pin 9 of PA5004 (Q8) being changed to positive/negative level. Balance can be changed continually from right channel only (—5V) to center (0V) and left channel only (+5V). PD6010 generates control signal outputs in binary code (7 steps for both left and right with a total of 15 steps). Following digital to analog conversion by R-2R ladder resistor and a level shift (generation of positive or negative voltage by voltage comparator), the balance control signal is obtained.

When the front panel BALANCE L or R button is pressed, the left/right volume balance is changed by a single step. If either button is kept depressed for more than 0.4 seconds, the balance is changed continuously. The BALANCE indicators (L and R) are controlled by outputs from Pin 20 (R) and pin 22 (L) of PD6010, the corresponding channel indicator lighting up when left or right channel is changed by even a single step.

IF–STOP : Frequency scanning stop switch used in auto tuning

Q204 is turned on by tuning detection signals from the FM/AM tuner section, resulting in halting of the scanning operation.

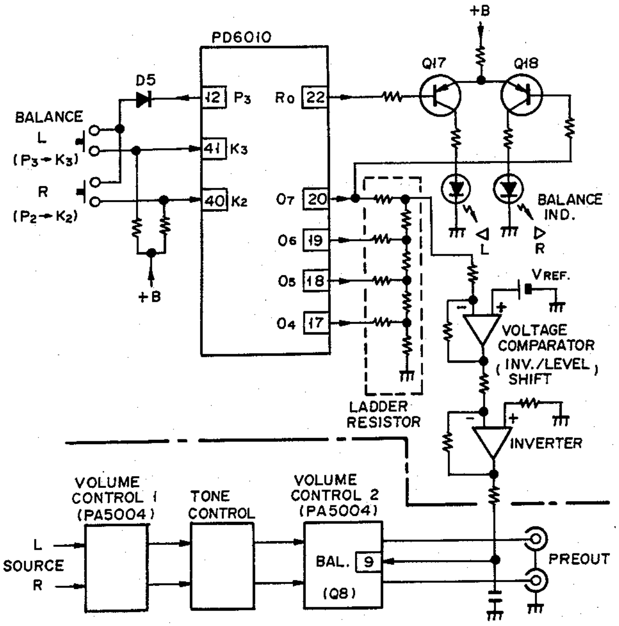

PD6010
D5
BALANCE
L
(P3→K3)
R
(P2→K2)
+B
12 P3
41 K3
40 K2
R0 22
O7 20
O6 19
O5 18
O4 17
+B
Q17
Q18
BALANCE IND.
L
R
VREF.
VOLTAGE COMPARATOR
(INV./LEVEL SHIFT)
LADDER RESISTOR
INVERTER
VOLUME CONTROL 1 (PA5004)
TONE CONTROL
VOLUME CONTROL 2 (PA5004)
L
SOURCE
R
BAL. 9
(Q8)
PREOUT

Fig. 1-17 Balance control circuit

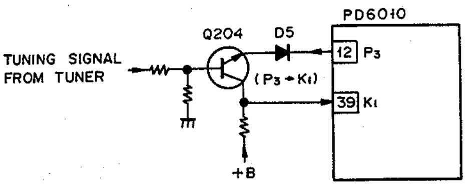

TUNING SIGNAL FROM TUNER
Q204
D5
(P3→K1)
+B
PD6010
12 P3
39 K1

Fig. 1-18 Auto scan stop key

The data signal passed from PD6010 to TD6301AP is 16-bit binary code serial data. This data is converted to 4-bit × 4 parallel data by data transfer clocks (CK1 and CK2) in TD6301AP, and then to 7-segment decimal data in order to drive the LED numeric display (four most significant digits). The fifth digit (least significant digit) is used for 10kHz unit display which can only be "0" or "5" (S/G and S types change frequency displays in 50kHz steps). The display is controlled by output data (H: 0, L: 5) from pin 27 of PD6010.

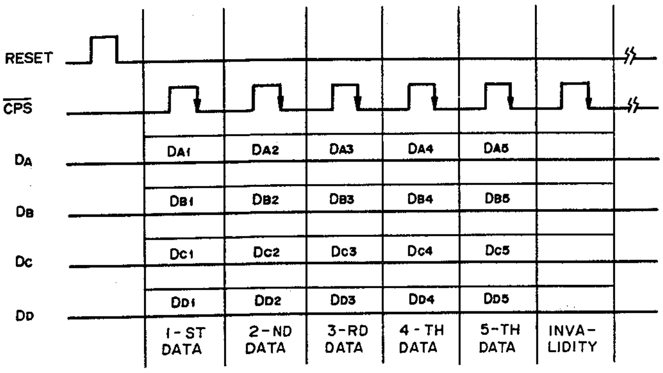

RESET
$\overline{CPS}$
DA
DB
DC
DD
DA1
DA2
DA3
DA4
DA5
DB1
DB2
DB3
DB4
DB5
DC1
DC2
DC3
DC4
DC5
DD1
DD2
DD3
DD4
DD5
1-ST DATA
2-ND DATA
3-RD DATA
4-TH DATA
5-TH DATA
INVA-LIDITY

Fig. 1-14 Synthesizer control data

AM : AM function switch

Data signals are passed from PD6010 to M54922P and TD6031AP when the front panel AM button is pressed, pin 16 of M54922P being changed to high level during AM mode. The FM/AM selector $\overline{AM}$ output (low level) activates the AM indicator, and switches the AM channel of the function switch on. This output also switches the tuner power supply to activate the AM tuner.

The fifth digitl of the LED numeric display is turned off by the $\overline{FM}$ signal being at high level.

CLOCK : Time display switch

The frequency display is changed to time display when the front panel CLOCK button is pressed. The PD6010 clock function is operated on the basis of a 500Hz signal applied to pin 8. This signal is obtained from pin 17 of M54922P after dividing the reference oscillator signal (4.5MHz) from the PLL synthesizer section.

Pin 26 of PD6010 is at low level during time display mode, resulting in a "colon" display and cancellation of the fifth digit. Although the time is shown in 12 hour cycles, there is no AM/PM display. Note that time is also displayed when the POWER switch is in the STAND-BY position, and during function modes (phono and aux) not requiring frequency display.

ST1 – ST8 : Frequency preset switches

When one of the front panel STATION CALL (1 to 8) buttons is pressed, the corresponding memory address is specified, and the relevant frequency data is read. At the same time, PD6010 passes display data (4-bit BCD code) to M74LS42P and the STATION indicator lamp corresponding to the designated memory comes on. If the designated memory is blank, the current tuned frequency remains unchanged. And if the memory is put into write enable status, the current tuned frequency is stored in that memory.

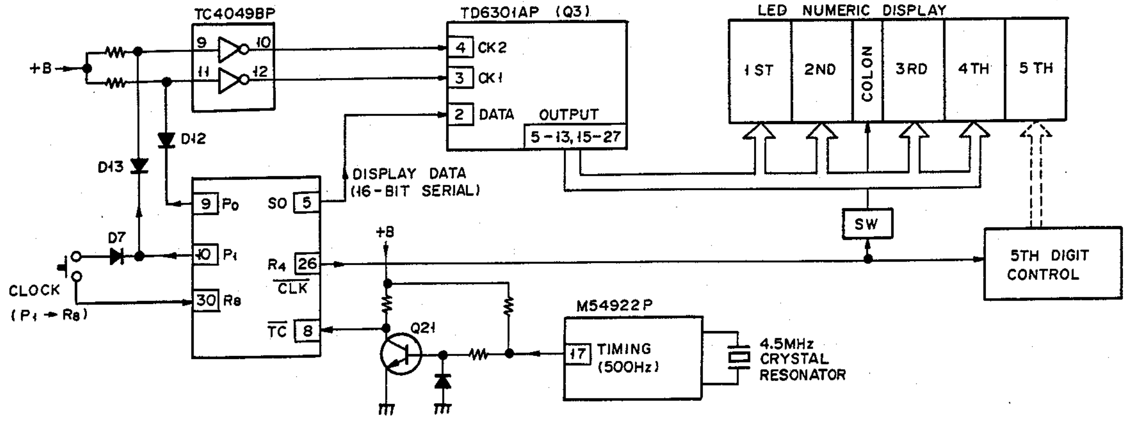

TC4049BP
9
10
11
12
+B
D12
D13
D7
CLOCK
(P1 → R8)
9 P0
10 P1
30 R8
SO 5
R4 26
$\overline{CLK}$
$\overline{TC}$ 8
TD6301AP (Q3)
4 CK2
3 CK1
2 DATA
OUTPUT
5-13, 15-27
DISPLAY DATA
(16-BIT SERIAL)
+B
Q21
M54922P
17 TIMING
(500Hz)
4.5MHz
CRYSTAL
RESONATOR
LED NUMERIC DISPLAY
1 ST
2ND
COLON
3RD
4TH
5 TH
SW
5TH DIGIT
CONTROL

Fig. 1-15 Clock function selection

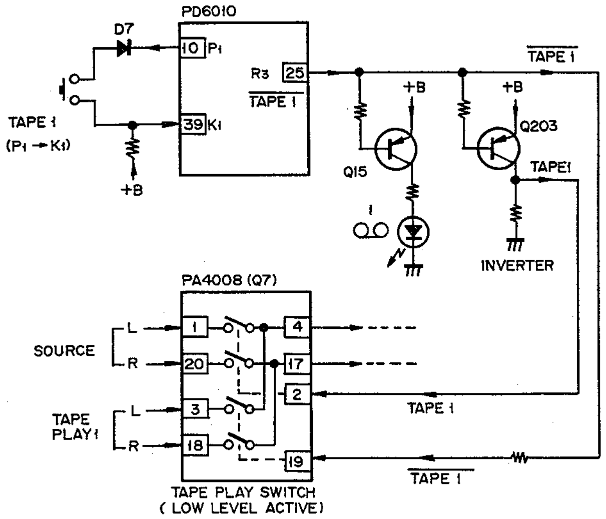

PD6010
D7
10 P1
R3 25
TAPE 1
39 K1
TAPE 1
(P1→K1)
+B
+B
+B
Q15
Q203
TAPE1
1
INVERTER
PA4008 (Q7)
SOURCE
L
R
1
20
4
17
2
TAPE 1
TAPE PLAY1
3
18
19
TAPE 1
TAPE PLAY SWITCH
(LOW LEVEL ACTIVE)

Fig. 1-11 TAPE 1 play switch

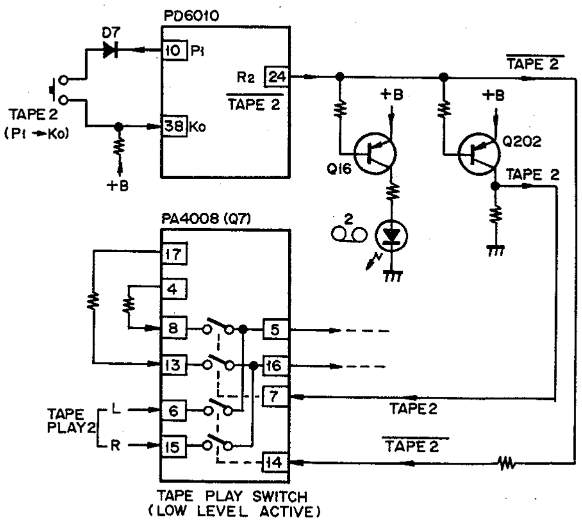

PD6010
D7
10 P1
R2 24
TAPE 2
TAPE 2
38 K0
TAPE 2
(P1→K0)
+B
+B
+B
Q16
Q202
TAPE 2
2
PA4008 (Q7)
17
4
8
5
13
16
7
TAPE2
TAPE PLAY2
L
R
6
15
14
TAPE2
TAPE PLAY SWITCH
(LOW LEVEL ACTIVE)

Fig. 1-12 TAPE 2 play switch

TAPE2 : TAPE 2 PLAY switch

The level of pin 24 (PD6010) is inverted (L/H) each time the front panel TAPE 2 button is pressed. When pin 24 is switched to low level, Q16 is turned on and the TAPE 2 indicator lamp comes on. This results in the source channel of the tape play switch being turned off, and the TAPE 2 channel being turned on.

FM : FM function switch

Data signals are passed from the PD6010 to the PLL synthesizer IC (M54922P) and numeric display driver IC (TD6301AP) when the front panel FM button is pressed. The composition of the signal passed to M54922P is shown in Fig. 1-14. After the RESET input is changed to low level, M54922P is synchronized with the CPS input and reads the 4×5 bit data. The first four data items set the division factor of the programmable divider, while the fifth data item sets the operating mode.

The M54922P pin 16 output controls the FM/AM selector circuit, pin 16 being changed to low level during FM mode. The FM/AM selector $\overline{\text{FM}}$ output (low level) activates the FM indicator lamp, and turns the FM channel of the function switch on. This output also switches the power supply for the tuner section, thereby activating the FM tuner.

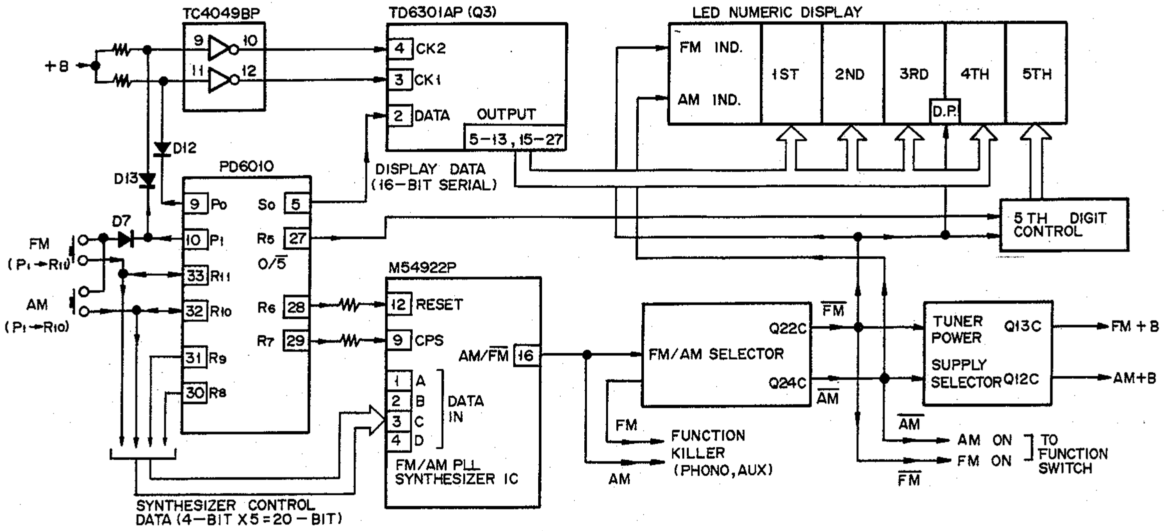

TC4049BP
9
10
11
12
+B
TD6301AP (Q3)
4 CK2
3 CK1
2 DATA
OUTPUT
5-13, 15-27
LED NUMERIC DISPLAY
FM IND.
AM IND.
1ST
2ND
3RD
4TH
5TH
D.P.
D12
D13
PD6010
DISPLAY DATA
(16-BIT SERIAL)
9 P0
S0 5
D7
FM
(P1→R11)
10 P1
R5 27
5TH DIGIT CONTROL
33 R11
0/5
AM
(P1→R10)
32 R10
R6 28
R7 29
31 R9
30 R8
M54922P
12 RESET
9 CPS
AM/FM 16
1 A
2 B
3 C
4 D
DATA IN
FM/AM PLL SYNTHESIZER IC
FM
Q22C
FM/AM SELECTOR
Q24C
AM
TUNER POWER SUPPLY SELECTOR
Q13C
Q12C
FM+B
AM+B
FM
FUNCTION KILLER (PHONO, AUX)
AM
AM
AM ON
FM ON
TO FUNCTION SWITCH
FM
SYNTHESIZER CONTROL DATA (4-BIT X5 = 20 - BIT)

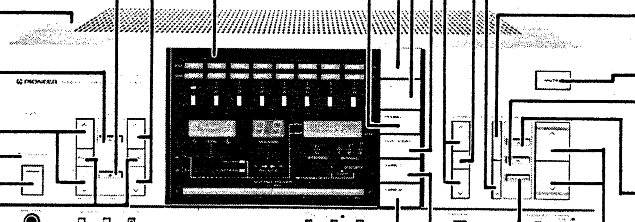
Fig. 1-13 FM, AM function selection

3. PARTS LOCATION

NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

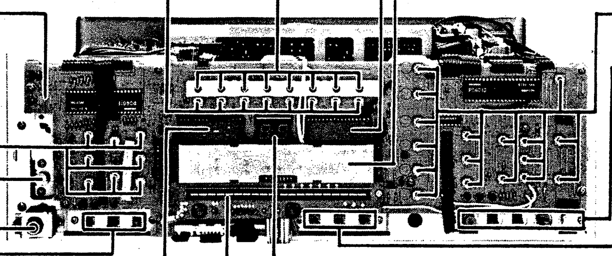
Front Panel View



Knob (FM) AAD-457
Knob (PHONO) AAD-459
Display cover ANR-491
Knob (TREBLE) AAD-471
Knob (PRESET B) AAD-464
Top cover ANE-380
Knob (PRESET A) AAD-463
Knob (BASS) AAD-471
Front panel assembly ANM-117
Knob (POWER) AAD-467
Knob (FLAT) AAD-472
Knob (SPEAKERS, CLOCK) AAD-484
Knob (MONO, TUNING) AAD-484
Knob (TAPE 2) AAD-462

Knob (AM) AAD-458
Knob (AUX/VIDEO) AAD-460
Knob (TUNING) AAD-471
Knob (Stop) AAD-473
Knob (BALANCE R) AAD-475
Knob (BALANCE L) AAD-474
Knob (MUTING) AAD-469
Knob (PRESET B) AAD-464
Knob (PRESET A) AAD-463
Knob (VOLUME) AAD-476
Knob (SUBSONIC, PHONO) AAD-484
Knob (LOUDNESS) AAD-466
Knob (MEMORY) AAD-470
Knob (TAPE 1) AAD-461

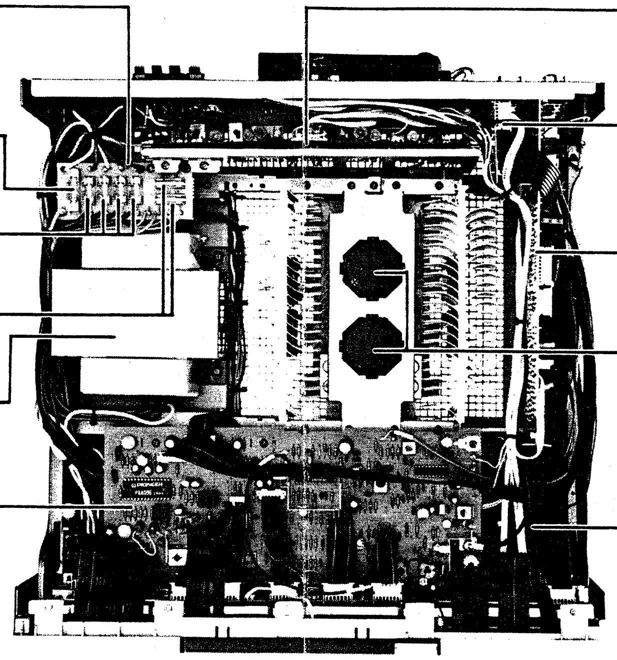
Front View with Panel Removed



★ LED (Station indicator) AEL-365
★★ Tact switch ASG-703
Control assembly GWK-196
★★ Tact switch ASG-703
⚠ ★★ Push switch (POWER) ASG-534
Phone jack (PHONES) AKN-030
★★ 3-ganged push switch (SPEAKERS, CLOCK) ASG-311
★ LED indicator (TONE) AEL-392

★ LED numeric display (Frequency/Time) AEL-378
★ LED array AAV-307
★★ Tact switch ASG-703
★★ 3-ganged push switch (MEMORY, SUBSONIC, PHONO) ASX-184
★★ 3-ganged push switch (MONO/MUTE OFF, TUNING) ASG-310
★ LED numeric display (VOLUME) AEL-391
★ LED level meter module AAV-306

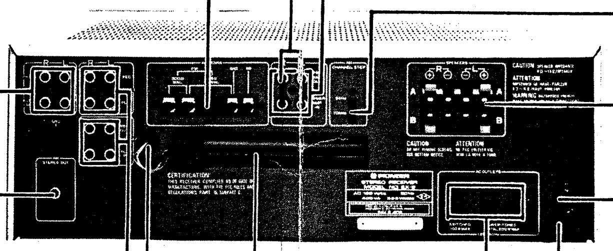
Top View



⚠ ★ Power transformer ATT-883
⚠ ★★ Fuse (8A) AEK-304
⚠ ★★ Fuse (2A) AEK-122
⚠ ★★ Fuse (1A) AEK-119
⚠ ★ Power transformer ATT-882
Tuner assembly GWE-178

Power amplifier assembly AWH-113
Tape terminal assembly GWS-392
EQ/Function assembly GWF-148
Electrolytic capacitor (12000/63V) ACH-209
TC/Power supply assembly GWM-229

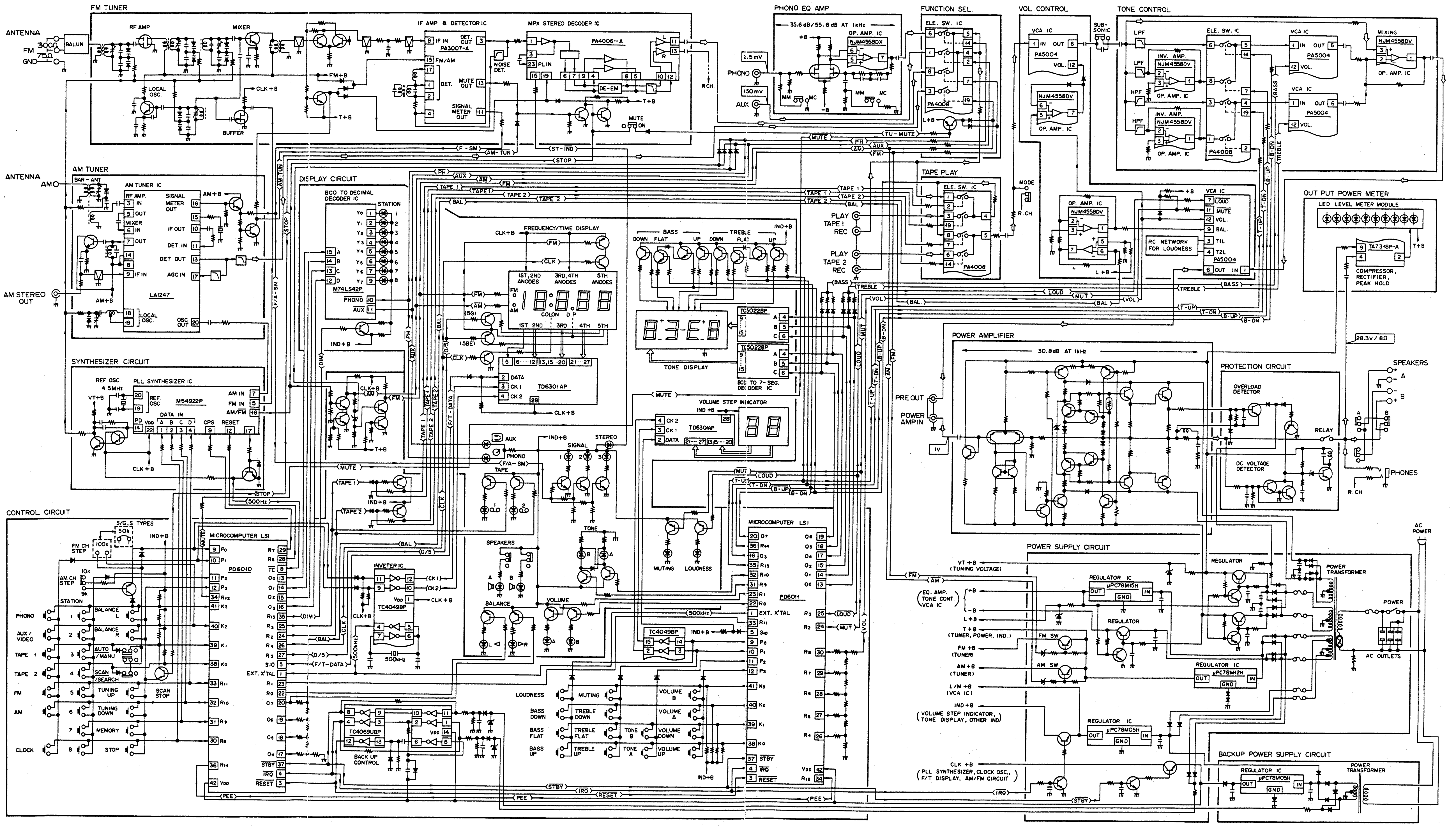
Rear Panel View



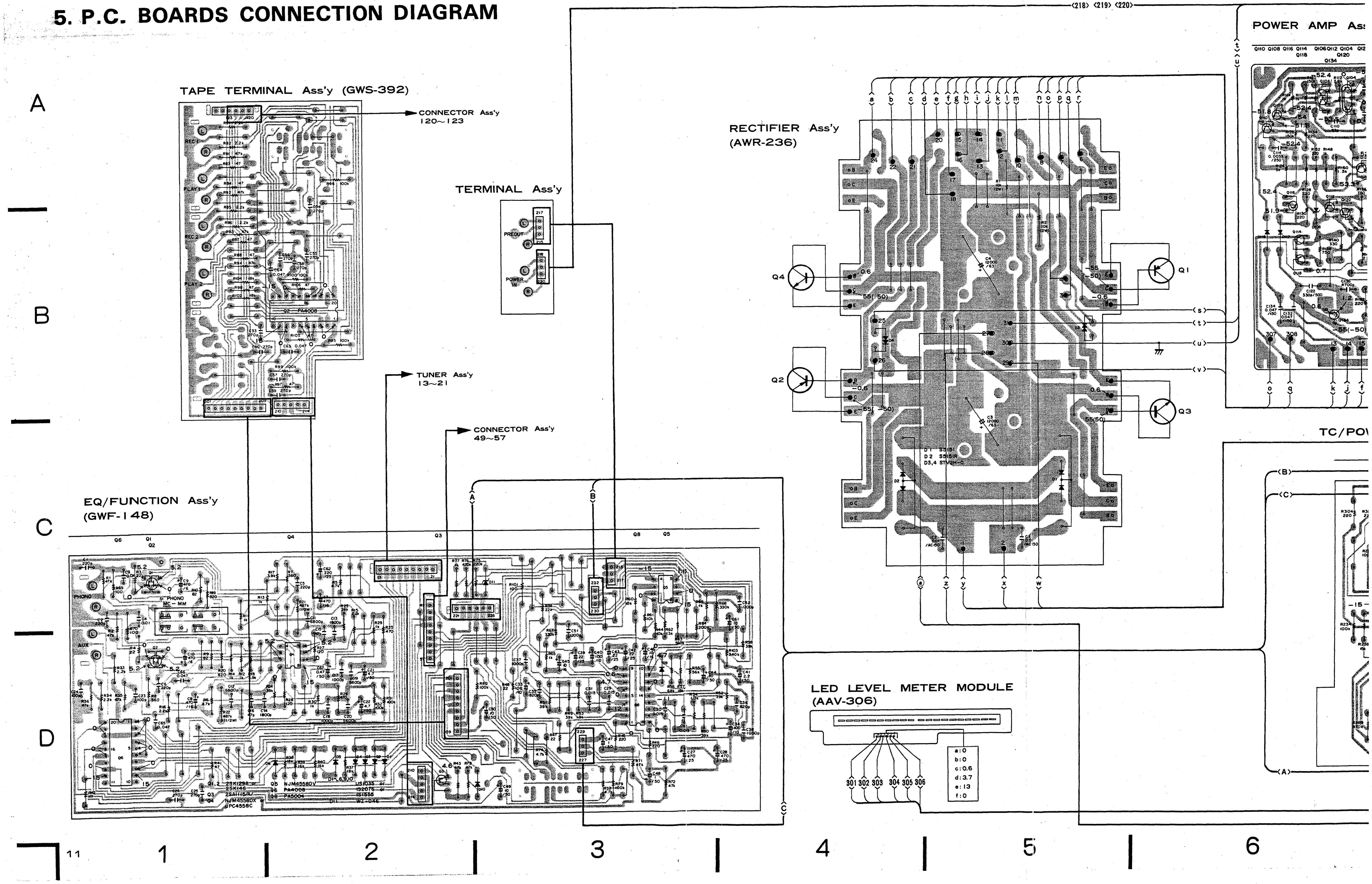
Jumper plug AKM-041
Terminal (ANTENNA) AKA-017
Terminal (PHONO, AUX) AKB-078
Terminal (AM STEREO OUT) AKB-076
Terminal (TAPE) AKB-078
Strain relief AEC-327
Bar-antenna assembly ATB-638

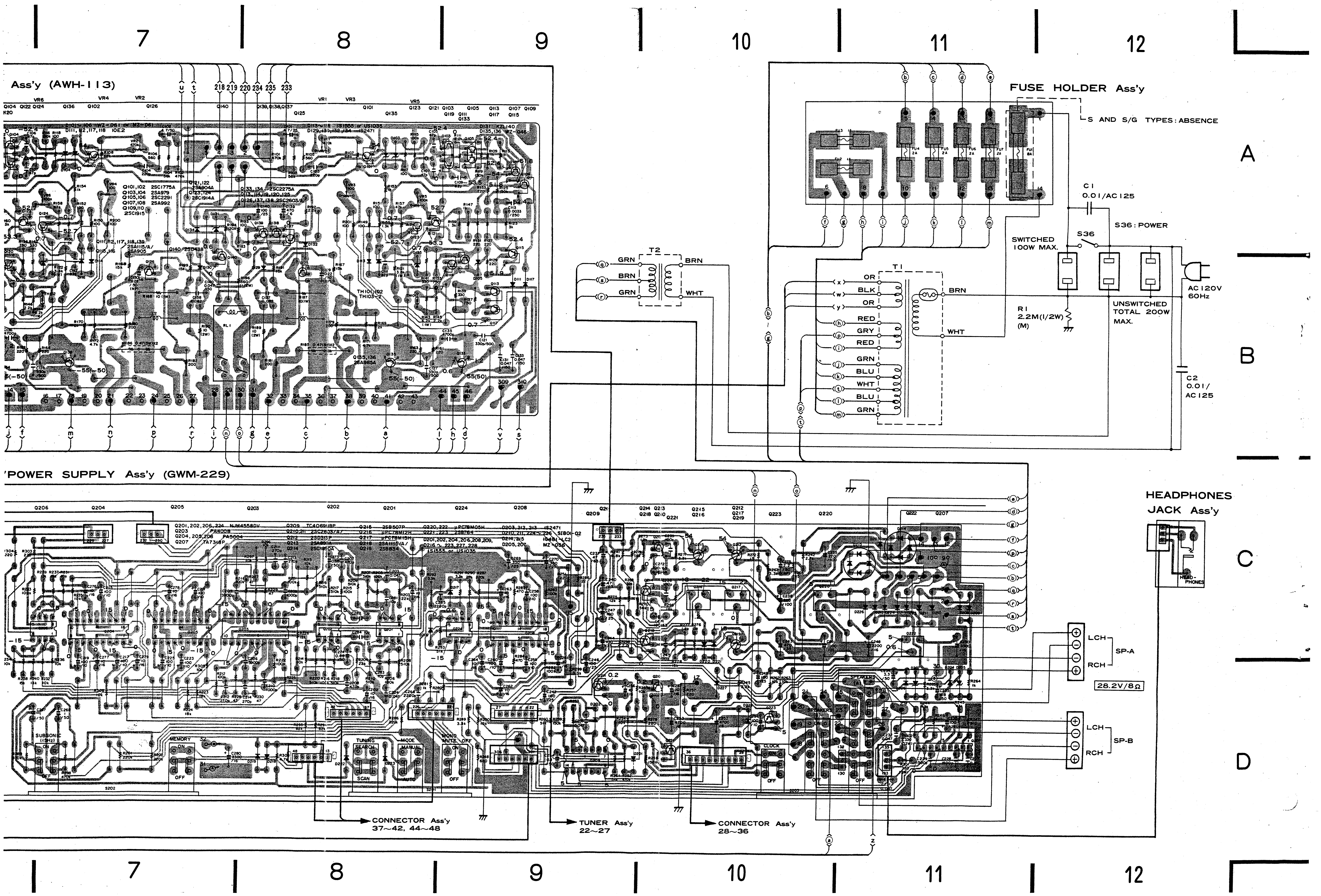
Terminal (PRE OUT/POWER AMP IN) AKB-078
★★ Slide switch (AM CHANNEL STEP) ASH-015
Terminal (SPEAKERS) AKE-105
Strain relief AEC-327
⚠ AC power cord ADG-052
⚠ AC socket (AC OUTLETS) AKP-041

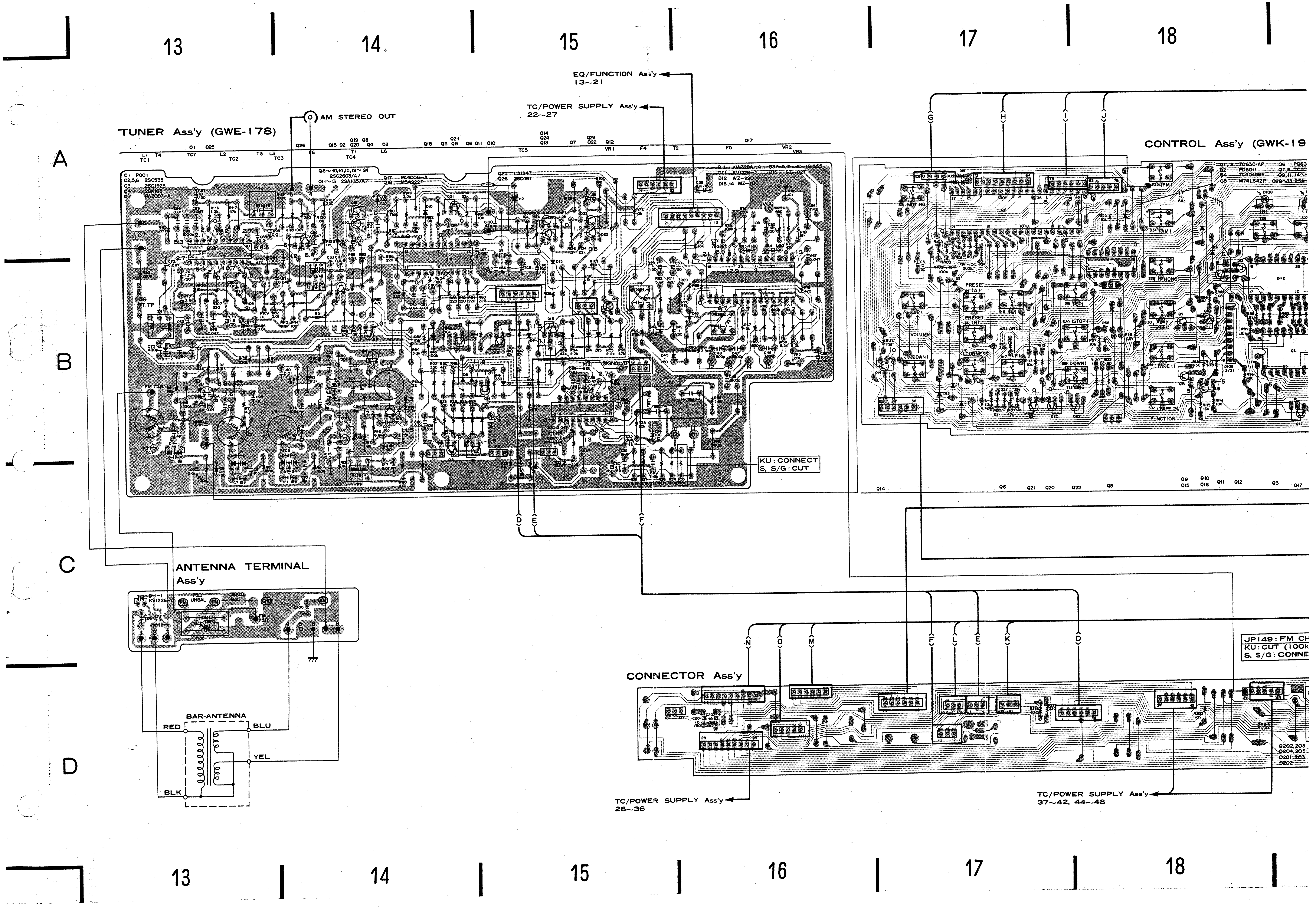
4. BLOCK DIAGRAM

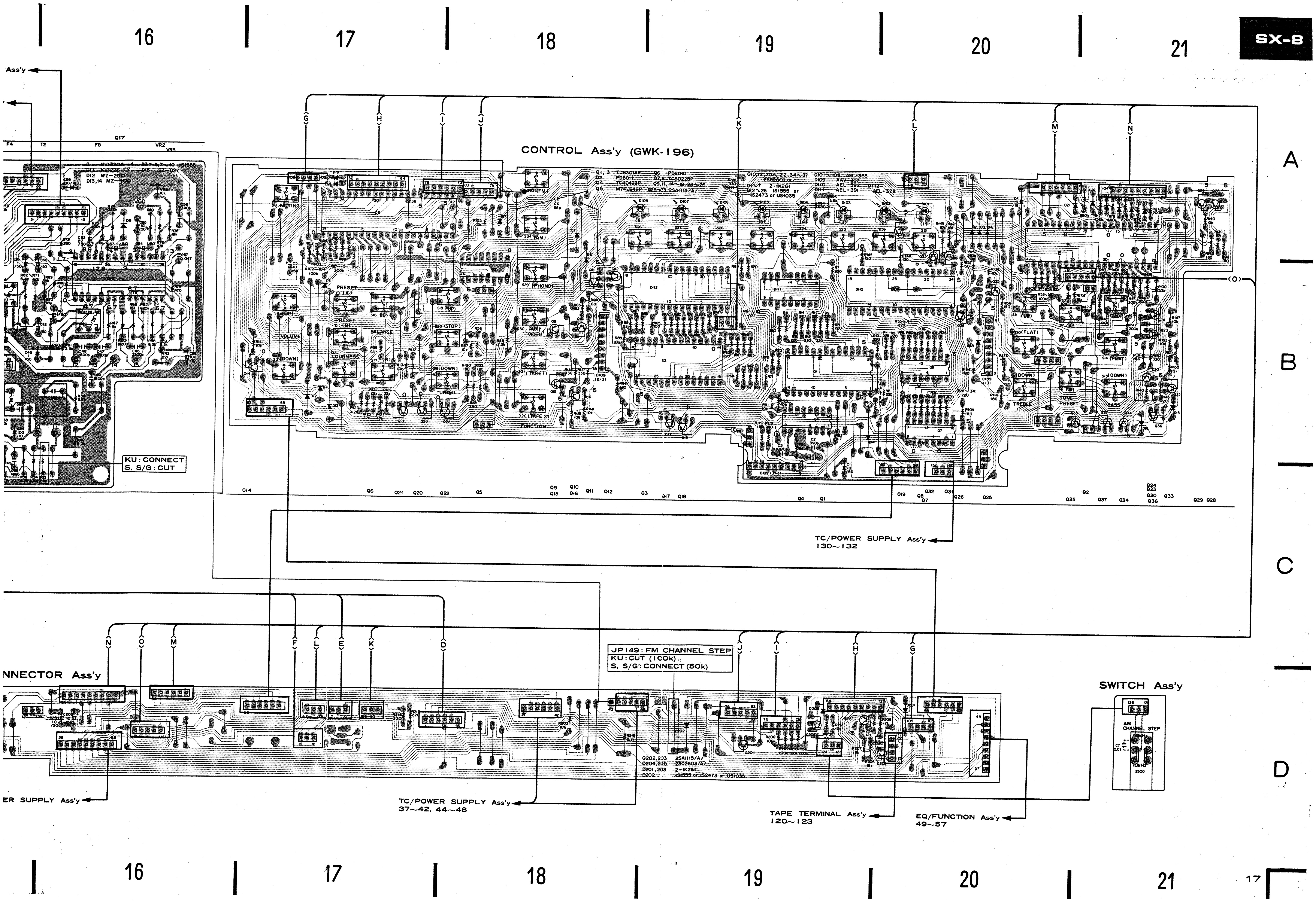

FM TUNER
ANTENNA
FM 300Ω
75Ω
GND
BALUN
RF AMP
MIXER
LOCAL OSC.
BUFFER
CLK+B
FM+B
T+B
IF AMP & DETECTOR IC
PA3007-A
NOISE DET.
SIGNAL METER OUT
MPX STEREO DECODER IC
PA4006-A
DE-EM
MUTE
R.CH
AM TUNER
ANTENNA AM
BAR-ANT
AM TUNER IC
LA1247
AM STEREO OUT
AM+B
SYNTHESIZER CIRCUIT
REF. OSC. 4.5MHz
PLL SYNTHESIZER IC
M54922P
VT+B
DISPLAY CIRCUIT
BCD TO DECIMAL DECODER IC
M74LS42P
STATION
FREQUENCY/TIME DISPLAY
1ST, 2ND ANODES
3RD, 4TH ANODES
5TH ANODES
COLON
D.P
TD6301AP
IND+B
BASS
TREBLE
DOWN
FLAT
UP
TONE DISPLAY
TC5022BP
BCD TO 7-SEG. DECODER IC
VOLUME STEP INDICATOR
TD6301AP
SIGNAL
STEREO
AUX
PHONO
TAPE
SPEAKERS
BALANCE
VOLUME
TONE
MUTING
LOUDNESS
CONTROL CIRCUIT
S/G/S TYPES
FM CH STEP
AM CH STEP
STATION
PHONO
AUX/VIDEO
TAPE 1
TAPE 2
FM
AM
CLOCK
BALANCE L
BALANCE R
AUTO/MANU
SCAN/SEARCH
TUNING UP
TUNING DOWN
MEMORY
STOP
SCAN STOP
MICROCOMPUTER LSI
PD6010
INVETER IC
TC4049BP
500kHz
TC4069UBP
BACK UP CONTROL
MICROCOMPUTER LSI
PD6011
TC4049BP
EXT. X'TAL
BASS DOWN
BASS FLAT
BASS UP
TREBLE DOWN
TREBLE FLAT
TREBLE UP
TONE B
TONE A
VOLUME B
VOLUME A
VOLUME DOWN
VOLUME UP
PHONO EQ AMP
35.6dB/55.6dB AT 1kHz
OP. AMP. IC
NJM4558DX
2.5mV
150mV
PHONO
AUX
MM
MC
FUNCTION SEL.
ELE. SW. IC
PA4008
VOL. CONTROL
VCA IC
PA5004
NJM4558DV
TONE CONTROL
SUB-SONIC
LPF
HPF
INV. AMP.
MIXING
TAPE PLAY
PLAY TAPE 1 REC
PLAY TAPE 2 REC
MODE
RC NETWORK FOR LOUDNESS
OUT PUT POWER METER
LED LEVEL METER MODULE
TA7318P-A
COMPRESSOR, RECTIFIER, PEAK HOLD
28.3V/8Ω
POWER AMPLIFIER
30.8dB AT 1kHz
PRE OUT
POWER AMP IN
PROTECTION CIRCUIT
OVERLOAD DETECTOR
DC VOLTAGE DETECTOR
RELAY
SPEAKERS
A
B
PHONES
R.CH
POWER SUPPLY CIRCUIT
VT+B (TUNING VOLTAGE)
EQ. AMP. TONE CONT. VCA IC
T+B (TUNER, POWER, IND.)
FM+B (TUNER)
AM+B (TUNER)
L/M+B (VCA IC)
IND+B (VOLUME STEP INDICATOR, TONE DISPLAY, OTHER IND)
CLK+B (PLL SYNTHESIZER, CLOCK OSC., F/T DISPLAY, AM/FM CIRCUIT)
FM SW
AM SW
REGULATOR IC
μPC78M15H
μPC78M12H
μPC78M05H
REGULATOR
POWER TRANSFORMER
AC POWER
POWER
AC OUTLETS
BACKUP POWER SUPPLY CIRCUIT

5. P.C. BOARDS CONNECTION DIAGRAM

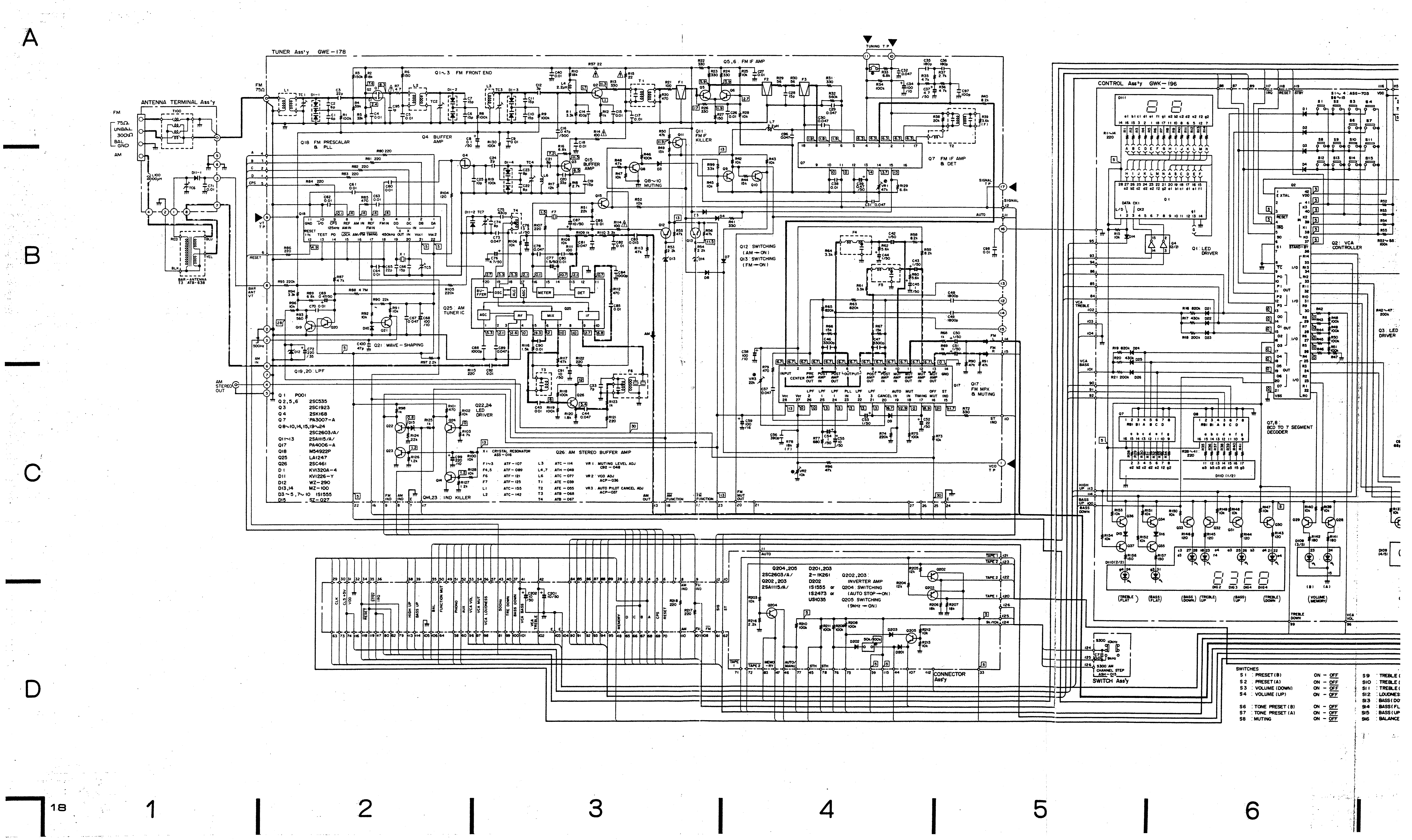

1
2
3
4
5
6
A
B
C
D
TAPE TERMINAL Ass'y (GWS-392)
CONNECTOR Ass'y 120~123
REC 1
PLAY 1
REC 2
PLAY 2
TERMINAL Ass'y
PREOUT
POWER IN
TUNER Ass'y 13~21
CONNECTOR Ass'y 49~57
<218> <219> <220>
RECTIFIER Ass'y (AWR-236)
Q1
Q2
Q3
Q4
C4 12000 /63
C3 12000 /63
D1 S5151
D2 S5151R
D3,4 STV2H-0
POWER AMP Ass
TC/POW
EQ/FUNCTION Ass'y (GWF-148)
PHONO
AUX
MC – MM
2SK129A or 2SK146
2SA1115A/
NJM4558DX or μPC4558C
NJM4558DV
PA4008
PA5004
US1035 or 1S2076
1S1555
WZ-046
LED LEVEL METER MODULE (AAV-306)
a:0
b:0
c:0.6
d:3.7
e:13
f:0
301 302 303 304 305 306
A
B
C


7
8
9
10
11
12
A
B
C
D
Ass'y (AWH-113)
/POWER SUPPLY Ass'y (GWM-229)
FUSE HOLDER Ass'y
S AND S/G TYPES: ABSENCE
C1 0.01/AC125
S36: POWER
S36
SWITCHED 100W MAX.
UNSWITCHED TOTAL 200W MAX.
AC120V 60Hz
R1 2.2M(1/2W) (M)
C2 0.01/AC125
T1
T2
GRN
BRN
GRN
BRN
WHT
OR
BLK
OR
RED
GRY
RED
GRN
BLU
WHT
BLU
GRN
BRN
WHT
HEADPHONES JACK Ass'y
HEAD-PHONES
LCH
RCH
SP-A
SP-B
28.2V/8Ω
CONNECTOR Ass'y 37~42, 44~48
TUNER Ass'y 22~27
CONNECTOR Ass'y 28~36
SUBSONIC (15Hz)
MEMORY
TUNING SEARCH
SCAN
MODE MANUAL
AUTO
MONO MUTE OFF
CLOCK
SPEAKERS
ON
OFF

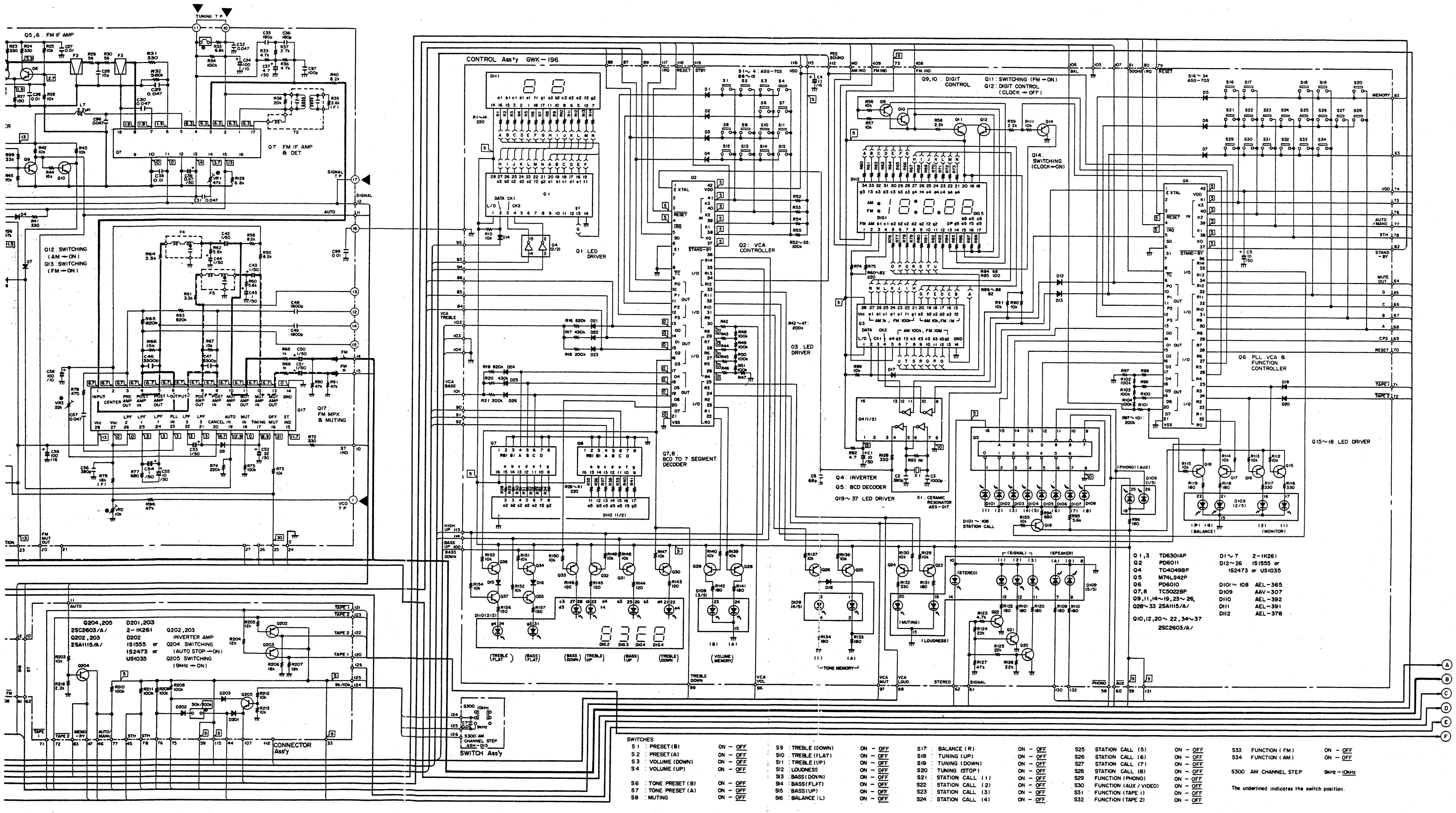

13
14
15
16
17
18
A
B
C
D
EQ/FUNCTION Ass'y 13~21
TC/POWER SUPPLY Ass'y 22~27
AM STEREO OUT
TUNER Ass'y (GWE-178)
Q1 P001
Q2,5,6 2SC535
Q3 2SC1923
Q4 2SK168
Q7 PA3007-A
Q8~10,14,15,19~24 2SC2603/A/
Q11~13 2SA1115/A/
Q17 PA4006-A
Q18 M54922P
Q25 LA1247
Q26 2SC461
D1 KV1320A-4
D11 KV1226-Y
D12 WZ-290
D13,14 MZ-100
D3~5,7~10 1S1555
D15 S2-027
VCO
SIGNAL TP
KU: CONNECT
S, S/G: CUT
FM 75Ω
CONTROL Ass'y (GWK-19
S8 MUTING
S33 (FM)
S34 (AM)
S29 (PHONO)
S30 AUX/VIDEO
S31 (TAPE 1)
S32 (TAPE 2)
PRESET
VOLUME
BALANCE
LOUDNESS
TUNING
FUNCTION
ANTENNA TERMINAL Ass'y
75Ω UNBAL
300Ω BAL
FM
GND
AM
BAR-ANTENNA
RED
BLU
YEL
BLK
CONNECTOR Ass'y
JP149: FM CH
KU: CUT (100k
S, S/G: CONNE
TC/POWER SUPPLY Ass'y 28~36
TC/POWER SUPPLY Ass'y 37~42, 44~48
D
E
F
G
H
I
J
K
L
M
N
O


16
17
18
19
20
21
A
B
C
D
Ass'y
CONTROL Ass'y (GWK-196)
Q1, 3 TD6301AP
Q2 PD6011
Q4 TC4049BP
Q5 M74LS42P
Q6 PD6010
Q7,8 TC5022BP
Q9,11, 14~19, 23~26, Q28~33 2SA1115/A/
Q10,12,20~22,34~37 2SC2603/A/
D1~7 2-1K261
D12~26 1S1555 or 1S2473 or US1035
D101~108 AEL-365
D109 AAV-307
D110 AEL-392
D111 AEL-391
D112 AEL-378
G
H
I
J
K
L
M
N
O
S8 MUTING
PRESET
S1 (B)
S2 (A)
BALANCE
LOUDNESS
VOLUME
S4 (UP)
S3 (DOWN)
S18 (UP)
S20 (STOP)
S19 (DOWN)
TUNING
S35 (FM)
S34 (AM)
S29 (PHONO)
S30 AUX/VIDEO
S31 (TAPE 1)
S32 (TAPE 2)
FUNCTION
S11 (UP)
S10 (FLAT)
S9 (DOWN)
TREBLE
TONE PRESET
S13 (UP)
S14 (FLAT)
S15 (DOWN)
BASS
KU: CONNECT
S. S/G: CUT
TC/POWER SUPPLY Ass'y
130~132
NNECTOR Ass'y
JP149: FM CHANNEL STEP
KU: CUT (100k)
S, S/G: CONNECT (50k)
Q202, 203 2SA1115/A/
Q204, 205 2SC2603/A/
D201, 203 2-1K261
D202 1S1555 or 1S2473 or US1035
ER SUPPLY Ass'y
TC/POWER SUPPLY Ass'y
37~42, 44~48
TAPE TERMINAL Ass'y
120~123
EQ/FUNCTION Ass'y
49~57
SWITCH Ass'y
AM CHANNEL STEP
10kHz
S300
16
17
18
19
20
21

6. SCHEMATIC DIAGRAM


1
2
3
4
5
6
A
B
C
D
TUNER Ass'y GWE-178
ANTENNA TERMINAL Ass'y
FM
75Ω UNBAL
300Ω BAL
GND
AM
BAR-ANTENNA T3 ATB-638
Q1~3 FM FRONT END
Q4 BUFFER AMP
Q15 BUFFER AMP
Q18 FM PRESCALAR & PLL
Q5,6 FM IF AMP
Q7 FM IF AMP & DET
Q8~10 MUTING
Q11 FM IF KILLER
Q12 SWITCHING (AM→ON)
Q13 SWITCHING (FM→ON)
Q17 FM MPX & MUTING
Q25 AM TUNER IC
Q21 WAVE-SHAPING
Q19,20 LPF
Q22,24 LED DRIVER
Q14,23 IND KILLER
Q26 AM STEREO BUFFER AMP
TUNING TP
SIGNAL TP
VCO TP
VT TP
Q1 P001
Q2,5,6 2SC535
Q3 2SC1923
Q4 2SK168
Q7 PA3007-A
Q8~10,14,15,19~24 2SC2603/A/
Q11~13 2SA1115/A/
Q17 PA4006-A
Q18 M54922P
Q25 LA1247
Q26 2SC461
D1 KV1320A-4
D11 KV1226-Y
D12 WZ-290
D13,14 MZ-100
D3~5,7~10 1S1555
D15 SZ-027
X1 CRYSTAL RESONATOR ASS-016
F1~3 ATF-107
F4,5 ATF-089
F6 ATF-121
F7 ATF-125
L1 ATC-155
L2 ATC-142
L3 ATC-114
L4,7 ATH-049
L6 ATC-077
T1 ATE-039
T2 ATE-055
T3 ATB-068
T4 ATB-067
VR1 MUTING LEVEL ADJ C92-048
VR2 VCO ADJ ACP-036
VR3 AUTO PILOT CANCEL ADJ ACP-037
CONTROL Ass'y GWK-196
S1~4 ASG-703
Q1 LED DRIVER
Q2 VCA CONTROLLER
Q3 LED DRIVER
Q7,8 BCD TO 7 SEGMENT DECODER
D110 (1/2)
D111
Q204,205 2SC2603/A/
Q202,203 2SA1115/A/
D201,203 2-1K261
D202 1S1555 or 1S2473 or US1035
Q202,203 INVERTER AMP
Q204 SWITCHING (AUTO STOP→ON)
Q205 SWITCHING (9kHz→ON)
CONNECTOR Ass'y
S300 AM CHANNEL STEP ASH-015
SWITCH Ass'y
(TREBLE FLAT)
(BASS FLAT)
(BASS DOWN)
(TREBLE UP)
(BASS UP)
(TREBLE DOWN)
(VOLUME MEMORY)
SWITCHES
S1 : PRESET (B) ON - OFF
S2 : PRESET (A) ON - OFF
S3 : VOLUME (DOWN) ON - OFF
S4 : VOLUME (UP) ON - OFF
S6 : TONE PRESET (B) ON - OFF
S7 : TONE PRESET (A) ON - OFF
S8 : MUTING ON - OFF
S9 : TREBLE (
S10 : TREBLE (
S11 : TREBLE (
S12 : LOUDNES
S13 : BASS (DO
S14 : BASS (FL
S15 : BASS (UP
S16 : BALANCE

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.


4
5
6
7
8
9
A
B
C
D
CONTROL Ass'y GWK-196
Q5,6 FM IF AMP
Q7 FM IF AMP & DET
TUNING T.P.
SIGNAL T.P.
VCO T.P.
Q12 SWITCHING (AM → ON)
Q13 SWITCHING (FM → ON)
Q17 FM MPX & MUTING
Q1 LED DRIVER
Q2 VCA CONTROLLER
Q3 LED DRIVER
Q7,8 BCD TO 7 SEGMENT DECODER
Q9,10 DIGIT CONTROL
Q11 SWITCHING (FM → ON)
Q12 DIGIT CONTROL (CLOCK → OFF)
Q14 SWITCHING (CLOCK→ON)
Q4 INVERTER
Q5 BCD DECODER
Q19~37 LED DRIVER
X1 CERAMIC RESONATOR ASS-017
Q6 PLL VCA & FUNCTION CONTROLLER
Q15~18 LED DRIVER
D101~108 STATION CALL
S1~4 : ASG-703
S16~34 ASG-703
Q204,205
2SC2603/A/
Q202,203
2SA1115/A/
D201,203
2-1K261
D202
1S1555 or
1S2473 or
US1035
Q202,203 INVERTER AMP
Q204 SWITCHING (AUTO STOP → ON)
Q205 SWITCHING (9kHz → ON)
CONNECTOR Ass'y
SWITCH Ass'y
S300 AM CHANNEL STEP ASH-015
Q1,3 TD6301AP
Q2 PD6011
Q4 TC4049BP
Q5 M74LS42P
Q6 PD6010
Q7,8 TC5022BP
Q9,11,14~19,23~26,
Q28~33 2SA1115/A/
Q10,12,20~22,34~37
2SC2603/A/
D1~7 2-1K261
D12~26 1S1555 or
1S2473 or US1035
D101~108 AEL-365
D109 AAV-307
D110 AEL-392
D111 AEL-391
D112 AEL-378
(TREBLE FLAT)
(BASS FLAT)
(BASS DOWN)
(TREBLE UP)
(BASS UP)
(TREBLE DOWN)
(VOLUME MEMORY)
TONE MEMORY
(MUTING)
(LOUDNESS)
(STEREO)
(SIGNAL)
(SPEAKER)
(PHONO)
(AUX)
(BALANCE)
(MONITOR)
A
B
C
D
E
F

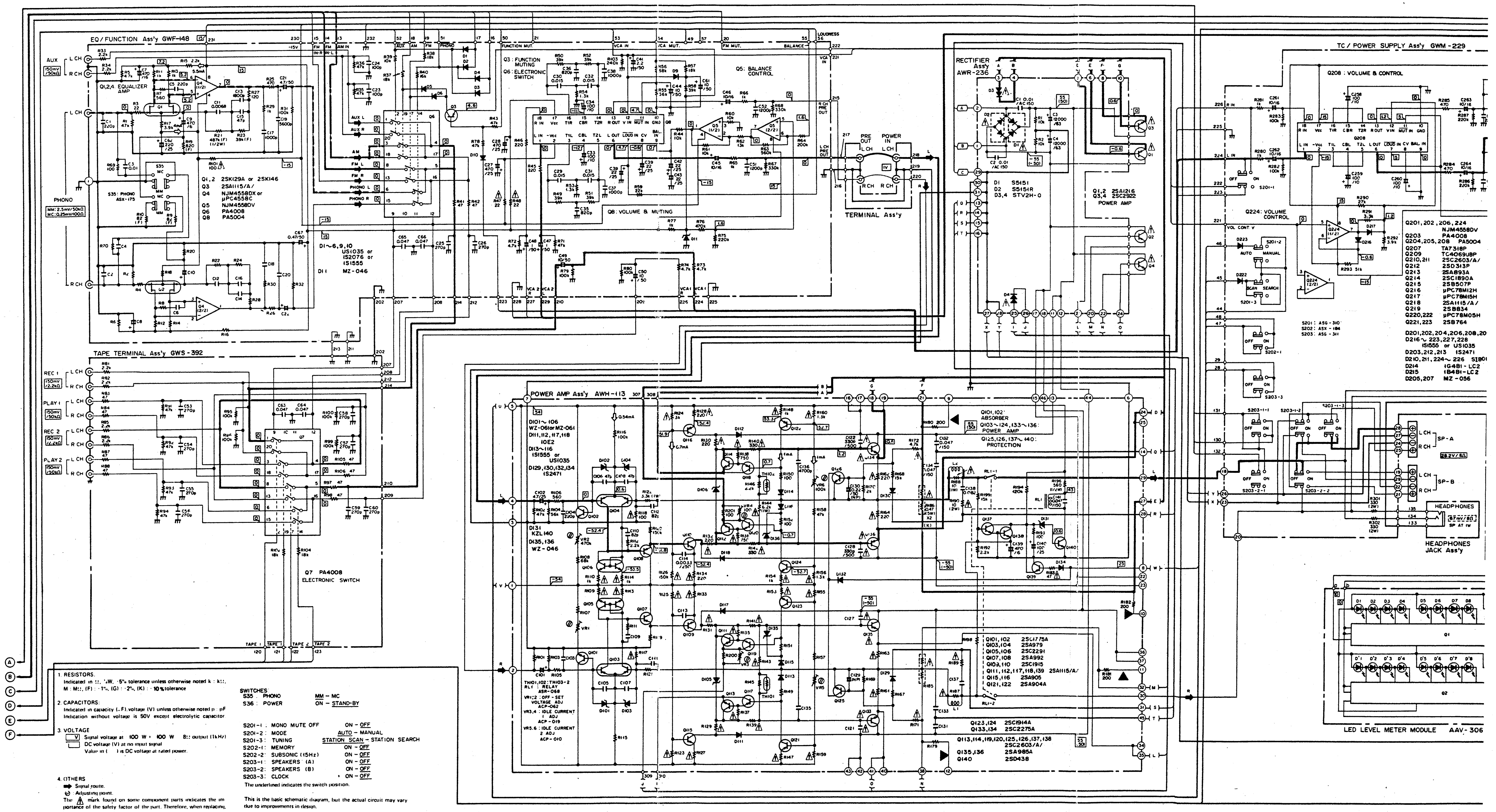
SWITCHES

S1 : PRESET (B) ON – OFF
S2 : PRESET (A) ON – OFF
S3 : VOLUME (DOWN) ON – OFF
S4 : VOLUME (UP) ON – OFF

S6 : TONE PRESET (B) ON – OFF
S7 : TONE PRESET (A) ON – OFF
S8 : MUTING ON – OFF
S9 : TREBLE (DOWN) ON – OFF
S10 : TREBLE (FLAT) ON – OFF
S11 : TREBLE (UP) ON – OFF
S12 : LOUDNESS ON – OFF
S13 : BASS (DOWN) ON – OFF
S14 : BASS (FLAT) ON – OFF
S15 : BASS (UP) ON – OFF
S16 : BALANCE (L) ON – OFF
S17 : BALANCE (R) ON – OFF
S18 : TUNING (UP) ON – OFF
S19 : TUNING (DOWN) ON – OFF
S20 : TUNING (STOP) ON – OFF
S21 : STATION CALL (1) ON – OFF
S22 : STATION CALL (2) ON – OFF
S23 : STATION CALL (3) ON – OFF
S24 : STATION CALL (4) ON – OFF
S25 STATION CALL (5) ON – OFF
S26 STATION CALL (6) ON – OFF
S27 STATION CALL (7) ON – OFF
S28 STATION CALL (8) ON – OFF
S29 FUNCTION (PHONO) ON – OFF
S30 FUNCTION (AUX / VIDEO) ON – OFF
S31 FUNCTION (TAPE 1) ON – OFF
S32 FUNCTION (TAPE 2) ON – OFF
S33 FUNCTION (FM) ON – OFF
S34 FUNCTION (AM) ON – OFF

S300 AM CHANNEL STEP 9kHz – 10kHz

The underlined indicates the switch position.


10
11
12
13
14
15
A
B
C
D
EQ/FUNCTION Ass'y GWF-148
Q1,2,4 EQUALIZER AMP
Q3 : FUNCTION MUTING
Q6 : ELECTRONIC SWITCH
Q5: BALANCE CONTROL
Q8: VOLUME & MUTING
AUX
PHONO
MM: 2.5mV/50kΩ
MC: 0.25mV/100Ω
S35: PHONO ASX-175
Q1,2 2SK129A or 2SK146
Q3 2SA1115/A/
Q4 NJM4558DX or μPC4558C
Q5 NJM4558DV
Q6 PA4008
Q8 PA5004
D1~6,9,10 US1035 or 1S2076 or 1S1555
D11 MZ-046
TAPE TERMINAL Ass'y GWS-392
REC 1
PLAY 1
REC 2
PLAY 2
Q7 PA4008 ELECTRONIC SWITCH
TERMINAL Ass'y
PRE OUT
POWER IN
RECTIFIER Ass'y AWR-236
D1 S5151
D2 S5151R
D3,4 STV2H-0
Q1,2 2SA1216
Q3,4 2SC2922
POWER AMP
POWER AMP Ass'y AWH-113
D101~106 WZ-061 or MZ-061
D111,112,117,118 10E2
D113~116 1S1555 or US1035
D129,130,132,134 1S2471
D131 KZL140
D135,136 WZ-046
Q101,102: ABSORBER
Q103~124,133~136: POWER AMP
Q125,126,137~140: PROTECTION
TH101,102:TH103-2
RL1 : RELAY ASR-068
VR1,2 : OFF-SET VOLTAGE ADJ ACP-062
VR3,4 : IDLE CURRENT 1 ADJ ACP-019
VR5,6 : IDLE CURRENT 2 ADJ ACP-010
Q101,102 2SC1775A
Q103,104 2SA979
Q105,106 2SC2291
Q107,108 2SA992
Q109,110 2SC1915
Q111,112,117,118,139 2SA1115/A/
Q115,116 2SA905
Q121,122 2SA904A
Q123,124 2SC1914A
Q133,134 2SC2275A
Q113,114,119,120,125,126,137,138 2SC2603/A/
Q135,136 2SA985A
Q140 2SD438
TC/POWER SUPPLY Ass'y GWM-229
Q208 : VOLUME & CONTROL
Q224: VOLUME CONTROL
Q201,202,206,224 NJM4558DV
Q203 PA4008
Q204,205,208 PA5004
Q207 TA7318P
Q209 TC4069UBP
Q210,211 2SC2603/A/
Q212 2SD313P
Q213 2SA893A
Q214 2SC1890A
Q215 2SB507P
Q216 μPC78M12H
Q217 μPC78M15H
Q218 2SA1115/A/
Q219 2SB834
Q220,222 μPC78M05H
Q221,223 2SB764
S201: ASG-310
S202: ASX-184
S203: ASG-311
D201,202,204,206,208,20
D216~223,227,228 1S1555 or US1035
D203,212,213 1S2471
D210,211,224~226 S1B01
D214 1G4B1-LC2
D215 1B4B1-LC2
D205,207 MZ-056
SP-A
SP-B
28.2V/8Ω
HEADPHONES
HEADPHONES JACK Ass'y
8.7mV/8Ω SP AT 1W
LED LEVEL METER MODULE AAV-306

1. RESISTORS.
Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% tolerance

2. CAPACITORS:
Indicated in capacity (μF), voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE
V Signal voltage at 100 W + 100 W 8Ω output (1kHz)
DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.

4. OTHERS
➡ Signal route.
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

SWITCHES:

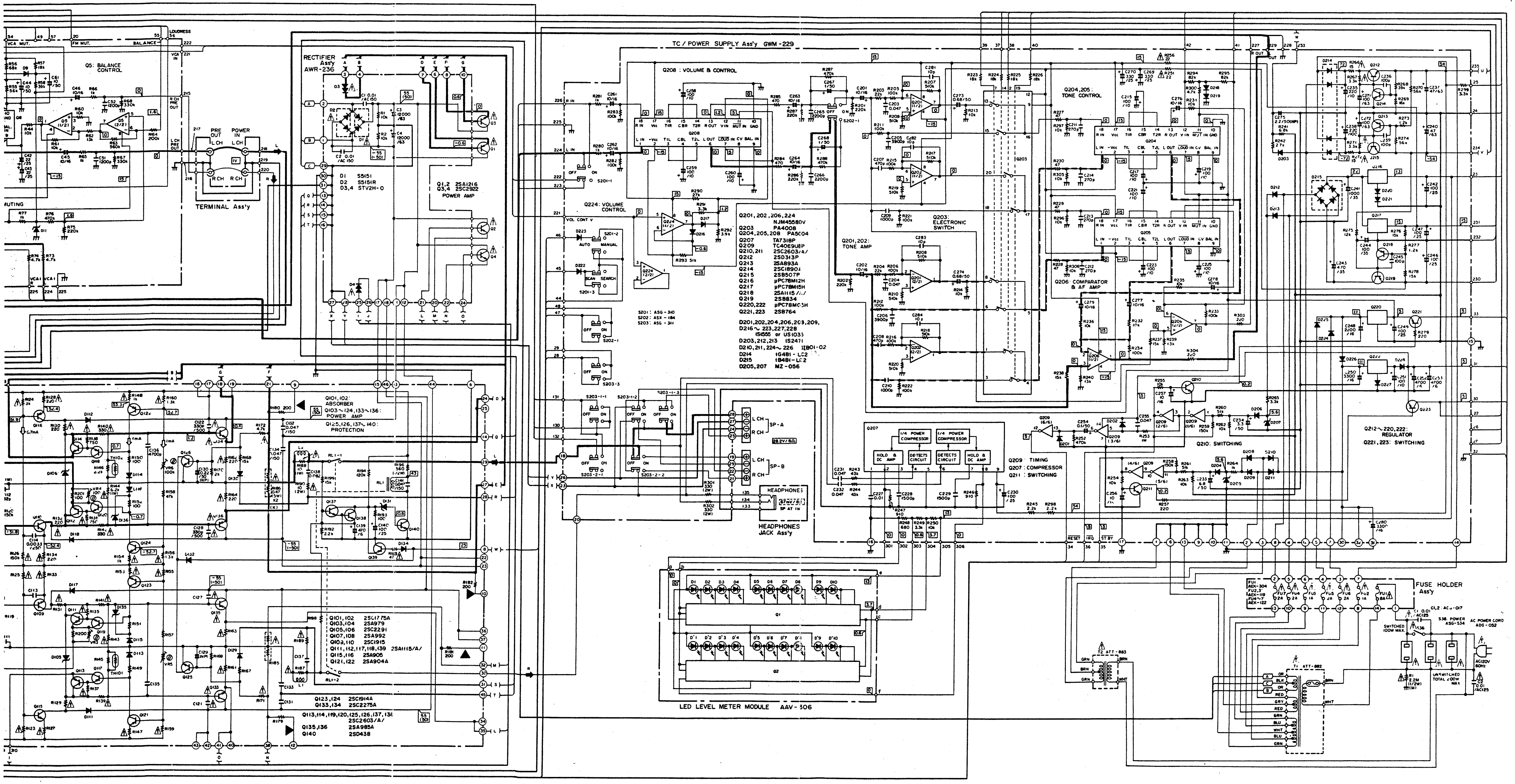
S35	PHONO	MM – MC
S36	POWER	ON – STAND-BY
S201-1	MONO MUTE OFF	ON – OFF
S201-2	MODE	AUTO – MANUAL
S201-3	TUNING	STATION SCAN – STATION SEARCH
S202-1	MEMORY	ON – OFF
S202-2	SUBSONIC (15Hz)	ON – OFF
S203-1	SPEAKERS (A)	ON – OFF
S203-2	SPEAKERS (B)	ON – OFF
S203-3	CLOCK	ON – OFF

The underlined indicates the switch position.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

A


Q5: BALANCE CONTROL
TERMINAL Ass'y
PRE OUT
POWER IN
L CH
R CH
RECTIFIER Ass'y AWR-236
D1 S5151
D2 S5151R
D3,4 STV2H-0
Q1,2 2SA1216
Q3,4 2SC2922
POWER AMP
TC / POWER SUPPLY Ass'y GWM-229
Q208 : VOLUME & CONTROL
Q224: VOLUME CONTROL
Q204,205: TONE CONTROL
Q201,202: TONE AMP
Q203: ELECTRONIC SWITCH
Q206: COMPARATOR & AF AMP
Q201,202,206,224 NJM4558DV
Q203 PA4008
Q204,205,208 PA5C04
Q207 TA7318P
Q209 TC4069UBP
Q210,211 2SC2603/A/
Q212 2SD313P
Q213 2SA893A
Q214 2SC1890/
Q215 2SB507P
Q216 μPC78M12H
Q217 μPC78M15H
Q218 2SA1115/../
Q219 2SB834
Q220,222 μPC78M05H
Q221,223 2SB764
D201,202,204,206,208,209, D216~223,227,228 IS1555 or US1031
D203,212,213 IS2471
D210,211,224~226 11B01-02
D214 1G4B1-LC2
D215 1B4B1-LC2
D205,207 MZ-056
S201: ASG-310
S202: ASX-184
S203: ASG-311
Q101,102: ABSORBER
Q103~124,133~136: POWER AMP
Q125,126,137~140: PROTECTION
Q101,102 2SC1775A
Q103,104 2SA979
Q105,106 2SC2291
Q107,108 2SA992
Q109,110 2SC1915
Q111,112,117,118,139 2SA1115/A/
Q115,116 2SA905
Q121,122 2SA904A
Q123,124 2SC1914A
Q133,134 2SC2275A
Q113,114,119,120,125,126,137,138 2SC2603/A/
Q135,136 2SA985A
Q140 2SD438
SP-A
SP-B
HEADPHONES
HEADPHONES JACK Ass'y
Q207
1/4 POWER COMPRESSOR
HOLD & DC AMP
DETECTS CIRCUIT
Q209 TIMING
Q207 COMPRESSOR
Q211 SWITCHING
Q210: SWITCHING
Q212~220,222: REGULATOR
Q221,223: SWITCHING
LED LEVEL METER MODULE AAV-506
FUSE HOLDER Ass'y
T2 ATT-883
T1 ATT-882
S36 POWER ASG-534
SWITCHED 100W MAX
UNSWITCHED TOTAL 200W MAX
AC POWER CORD ADG-052
AC120V 60Hz

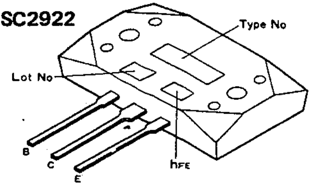
B

C

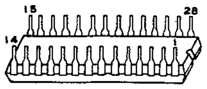
D

External Appearance of Transistors and ICs

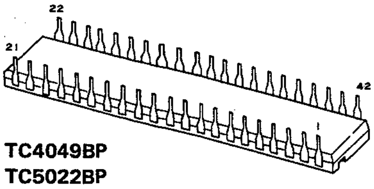
2SA1216
2SC2922


Type No
Lot No
B
C
E
hFE

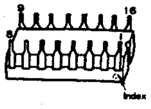
TD6301AP



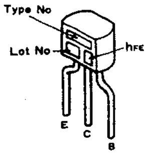
PD6010
PD6011



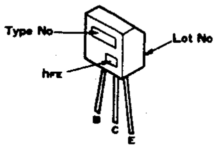
TC4049BP
TC5022BP
M74LS42P



2SA1115/A/
2SC2603/A/


Type No
Lot No
hFE
E
C
B

2SC461
2SC535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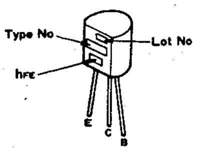
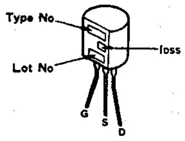
Lot No
hFE
B
C
E

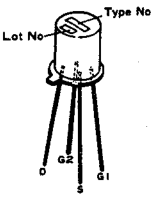
2SC1923


Type No
Lot No
hFE
E
C
B

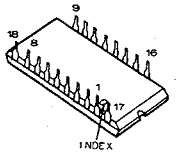
2SK168


Type No
Ioss
Lot No
G
S
D

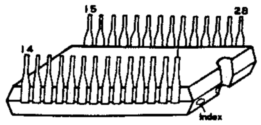
P001


Type No
Lot No
D
G2
S
G1

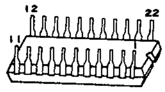
PA3007-A


9
18
8
16
1
17
INDEX

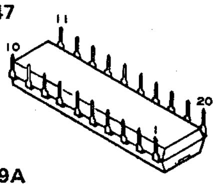
PA4006-A


15
28
14
Index

M54922P



LA1247



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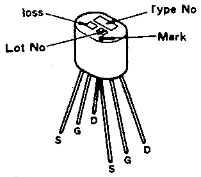
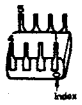

Ioss
Type No
Lot No
Mark
S
G
S
G
D

NJM4558DX
NJM4558DV
μPC4558C-P



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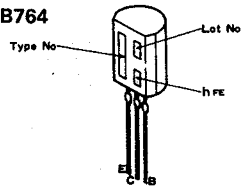
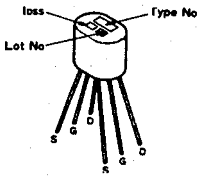
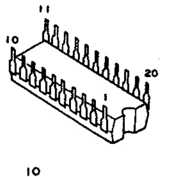
2SB764


Type No
Lot No
hFE
E
C
B

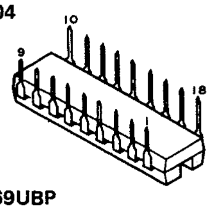
2SK146


Ioss
Type No
Lot No
S
G
D
S
G
D

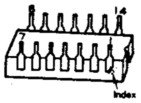
PA4008



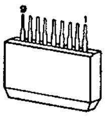
PA5004



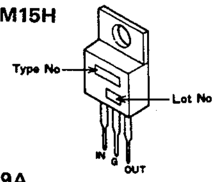
TC4069UBP



TA7318P



μPC78M05H
μPC78M12H
μPC78M15H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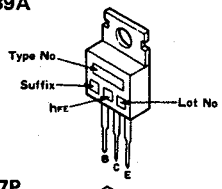
Lot No
IN
G
OUT

2SA839A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Suffix
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Lot No
B
C
E

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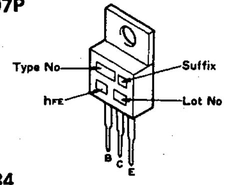
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C
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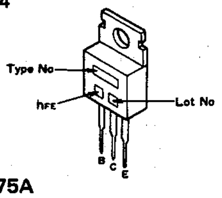
2SB834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Lot No
B
C
E

2SC1775A
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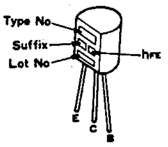
Type No
Suffix
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E
C
B

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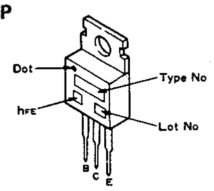
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Type No
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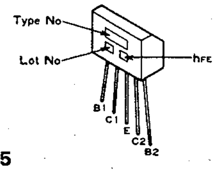
Lot No
B
C
E

2SA979


Type No
Lot No
hFE
B1
C1
E
C2
B2

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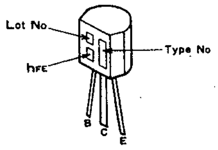
2SC1915


Lot No
Type No
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B
C
E

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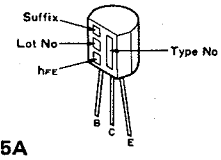
Suffix
Lot No
hFE
Type No
B
C
E

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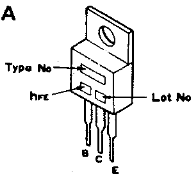
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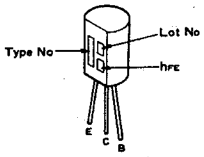
hFE
Lot No
B
C
E

2SA992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Type No
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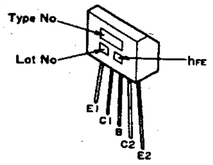
E
C
B

2SC2291


Type No
Lot No
hFE
E1
C1
B
C2
E2

7. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

  560Ω   56 × 10^1 561 ..... RD¼PS $\boxed{5}\boxed{6}\boxed{1}$ J
  47kΩ   47 × 10^3 473 ..... RD¼PS $\boxed{4}\boxed{7}\boxed{3}$ J
  0.5Ω   0R5 .... RN2H $\boxed{0}\boxed{R}\boxed{5}$ K
  1Ω   010 .... RS1P $\boxed{0}\boxed{1}\boxed{0}$ K

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

  5.62kΩ   562 × 10^1 5621 .... RN¼SR $\boxed{5}\boxed{6}\boxed{2}\boxed{1}$ F
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*

  ★★ GENERALLY MOVES FASTER THAN ★

  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
⚠ ★★	2SA1216-G* (2SA1216-O*) (2SA1216-Y*)	Q1,Q2
⚠ ★★	2SC2922-G* (2SC2922-O*) (2SC2922-Y*)	Q3,Q4

*hfe of these transistors (Q1–Q4) should have the same value.

Mark	Part No.	Symbol & Description
★	AAV-306	LED level meter module

FUSES

Mark	Part No.	Symbol & Description
⚠ ★★	AEK-304	FU1 Fuse (8A/125V)
⚠ ★★	AEK-119	FU2,FU3 Fuse (1A/125V)
⚠ ★★	AEK-122	FU4–FU7 Fuse (2A/125V)

P. C. BOARD ASSEMBLIES

Mark	Part No.	Symbol & Description
	GWK-196	Control assembly Connector assembly Switch assembly
	GWE-178	Tuner assembly Antenna terminal assembly
	GWF-148	EQ/Function assembly
	GWS-392	Tape terminal assembly
	GWM-229	TC/Power supply assembly Headphones jack assembly Terminal assembly Fuse holder assembly
	AWR-236	Rectifier assembly
	AWH-113	Power amplifier assembly

OTHERS

Mark	Part No.	Symbol & Description	
⚠	ACG-017	C1,C2	Ceramic capacitor (0.01/AC125V)
⚠	ACN-029	R1	Carbon composition resistor (2.2M/½W)
⚠ ★	ATT-882	T1	Power transformer
⚠ ★	ATT-883	T2	Power transformer
	ATB-638	T3	Bar-antenna assembly
⚠ ★★	ASG-534	S36	Push switch (POWER)
⚠	AKP-041	AC socket (AC OUTLETS)	
⚠	ADG-052	AC power cord	
	AKB-076	Terminal (AM STEREO OUT)	
	AKE-105	Terminal (SPEAKERS)	
	AKM-041	Jumper plug	

Control Assembly (GWK-196)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEJA 100M 50	C1,C5
	CKDYB 391K 50	C2
	CKDYB 102K 50	C3
	CEB 100P 16	C4
	CCDSL 680J 50	C6

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/8PM ☐☐☐ J	R1–R21, R28–R104, R109–R134, R136, R137, R139–R157

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	TD6301AP	Q1,Q3
★★	PD6010	Q6
★★	PD6011	Q2
★★	TC4049BP	Q4
★★	M74LS42P	Q5
★★	TC5022BP	Q7,Q8
★★	2SA1115/A/	Q9, Q11, Q14–Q19, Q23–Q26, Q28–Q33
★★	2SC2603/A/	Q10,Q12,Q20–Q22,Q34–Q37
★	2-1K261	D1–D7
★	1S1555 (1S2473) (US1035)	D12–D26
★	AEL-365	D101–D108 LED (Red)
★	AAV-307	D109 LED array
★	AEL-392	D110 LED indicator (Tone)
★	AEL-391	D111 LED numeric display (Volume step)
★	AEL-378	D112 LED numeric display (Frequency/Time)

OTHERS

Mark	Part No.	Symbol & Description
★	ASS-017	X1 Ceramic resonator
★★	ASG-703	S1–S4,S6–S34 Tact switch

Connector Assembly

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 100M 50L	C201,C202

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/8PM □□□ J	R203–R213,R216–R218

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SA1115/A/	Q202,Q203
★★	2SC2603/A/	Q204,Q205
★	2-1K261	D201,D203
★	1S1555 (1S2473) (US1035)	D202

Switch Assembly

Mark	Part No.	Symbol & Description
★★	ASH-015	S300 Slide switch (AM CHANNEL STEP)
	CKDYF 103Z 50	C7

Tuner Assembly (GWE-178)

CAPACITORS

Mark	Part No.	Symbol & Description
	ACM-014	TC1–TC3 Ceramic trimmer
	ACM-006	TC4 Ceramic trimmer
	ACM-017	TC5 Ceramic trimmer
	ACM-015	TC7 Ceramic trimmer
	CEANL 010M 50	C42,C43,C50,C51,C53,C54
	CEA 100M 50L	C55,C87,C91
	CEA 101M 16L	C59
	CEA 101M 10L	C34,C58,C68
	CEA 010M 50L	C44,C45
	CEA 220M 50L	C52
	CEA 0R1M 50L	C8
	CEANL R47M 50	C69
	CEA 4R7M 50L	C37,C76
	CCDRH 150J 50	C6,C7,C10,C11,C19
	CCDCH 150J 50	C66
	CCDCH 220J 50	C65
	CCDRH 060D 50	C1,C2
	CCDRH 330J 50	C20
	CCDTH 080D 50	C21–C23,C74
	CCDCH 030C 50	C12
	ACG-018	C56 Ceramic (390p/50V, CH)
	CCDSL 220J 50	C3
	CCDSL 181J 50	C35,C36
	CCDSL 101J 50	C14
	CEA 3R3M 50L	C77
	CEA 1R5M 50L	C79
	CEA 221M 10L	C99
	CKDYB 102K 50	C84,C88
	CCDSL 010C 50	C95
	CQMA 153K 50	C83
	CQMA 103J 50	C64
	CQSA 332J 50	C46,C47
	CQSA 431J 50	C75
	CQSA 182J 50	C48,C49
	CCDCH 100D 50	C25
	CCDCH 020C 50	C24
	CGB R47K 500	C16
	CCDSL 151J 50	C28
	CEA 221M 35L	C72
	CKDYF 103Z 50	C4, C5, C9, C15, C17, C18, C26, C27, C38, C40, C60–C63, C70, C80, C82, C85, C86, C90, C92, C93, C98
	CKDYF 473Z 50	C29–C32, C57, C67, C73, C78, C81, C89, C94, C96
	CCDSL 070D 50	C33
	CCDSL 470J 50	C100
	CEA R47M 50L	C39

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	C92-048	VR1 Semi-fixed (47k-B)
★	ACP-036	VR2 Semi-fixed (10k-B)
★	ACP-037	VR3 Semi-fixed (22k-B)
	RD¼PM □□□ J	R1–R6, R8–R13, R16–R38, R40–R56, R58–R77, R99–R113, R115–R131
	RN¼PQ □□□□ F	R39,R78
⚠	RD¼PMF □□□ J	R7,R14,R15,R57,R114

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SA1115/A/	Q11–Q13
★★	2SC2603/A/	Q8–Q10,Q15,Q19–Q21
★★	2SC2603/A/-F	Q14,Q22–Q24
★★	2SC461	Q26
★★	2SC535	Q2,Q5,Q6
★★	2SC1923	Q3
★★	2SK168	Q4
★★	P001	Q1
★★	PA3007-A (PA3007)	Q7
★★	PA4006-A	Q17
★★	M54922P	Q18
★★	LA1247	Q25
★	SZ-027	D15
★	WZ-290	D12
★	MZ-100 (WZ-100)	D13,D14
★	1S1555	D3–D5,D7–D10
★	KV1320A-4	D1
★	KV1226-Y	D11

*KV1320A-4 consists of four twin vari-cap diode with the indentical characteristics.

*KV1226-Y consists of two vari-cap diodes with indentical characteristics.

COILS AND FILTERS

Mark	Part No.	Symbol & Description
	ATC-155	L1 FM ANT. coil
	ATC-142	L2 FM RF coil
	ATC-114	L3 FM RF coil
	ATH-049	L4,L7 RF choke coil
	ATC-077	L6 FM osc. coil
	ATE-039	T1 FM IF transformer
	ATE-055	T2 FM det. transformer
	ATB-068	T3 AM IF coil
	ATB-067	T4 AM osc. coil
	ATF-107	F1–F3 FM ceramic filter
	ATF-089	F4,F5 FM low-pass filter
	ATF-121	F6 AM ceramic filter
★	ATF-125	F7 Ceramic resonator

OTHERS

Mark	Part No.	Symbol & Description
★	ASS-016	X1 Crystal resonator
	AKB-025	Terminal (From balun)

Antenna Terminal Assembly

Mark	Part No.	Symbol & Description
	ACM-015	TC6 Ceramic trimmer
	CKDYF 103Z 50	C71
	ATX-013	T100 Balun
	AKA-017	Terminal (ANTENNA)
	AKB-025	Terminal (To FM frontend)

EQ/Function Assembly (GWF-148)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 471M 6L	C9,C10
	CEA 471M 16L	C7,C8
	CEANL 4R7M 50	C21,C22
	CEANL 100M 50	C49,C50
	CEANL 010M 50	C47,C48
	CEANL 100M 16	C45,C46
	CEA 101M 10L	C33,C34,C40
	CEA 2R2M 50L	C41
	CEA 221M 25L	C62
	CEA 471M 25L	C27,C28
	CEA 220M 25L	C39,C42,C43
	CEA 100M 50L	C44,C61
	CCDSL 101J 50	C23,C24
	CCDSL 271J 50	C25,C26
	CCDSL 221J 50	C1,C2,C5,C6
	CQMA 182J 50	C13,C14
	CCDSL 470J 50	C15,C16
	CQMA 682J 50	C11,C12
	CKDYB 102K 50	C17,C18,C37,C38
	CKDYB 562K 50	C19,C20
	CKDYB 821K 50	C35,C36
	CQMA 153J 50	C29–C32
	CQMA 122J 50	C51,C52
	CQMA 103J 50	C3,C4
	CKDYF 473Z 50	C65,C66
	CEA R47M 50L	C67

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RN½PQ □□□□ F	R21,R22
	RN¼PQ □□□□ F	R9,R10,R19,R20,R23,R24
⚠	RD¼PMF □□□ J	R47,R48,R101
	RD¼PM □□□ J	R1–R8, R11–R18, R25–R46, R49–R80, R103

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SK129A (2SK146)	Q1,Q2
★★	2SA1115/A/	Q3
★★	NJM4558DX (μPC4558C-P)	Q4
★★	NJM4558DV	Q5
★★	PA4008	Q6
★★	PA5004	Q8
★	US1035 (1S2076) (1S1555)	D1–D6,D9,D10
★	WZ-046	D11

OTHERS

Mark	Part No.	Symbol & Description
★★	ASX-175	S1 Remote slide switch (MM/MC)
	AKB-078	Terminal (PHONO, AUX)

Tape Terminal Assembly (GWS-392)

CAPACITORS

Mark	Part No.	Symbol & Description
	CCDSL 271J 50	C53–C60
	CKDYF 473Z 50	C63,C64

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD¼PM □□□ J	R81–R88, R91–R100, R102, R104–R106

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	PA4008	Q7

OTHERS

Mark	Part No.	Symbol & Description
	AKB-078	Terminal (TAPE)

TC/Power Supply Assembly (GWM-229)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 221M 100L	C235,C238
	CEA 101M 63L	C271,C272
	CEA 470M 63L	C237,C240
	CEA 102M 35L	C241
	CEA 471M 35L	C243
	CEA 101M 35L	C244
	CEA 331M 25L	C269,C270
	CEA 101M 25L	C246,C247,C230
	CEA 222M 16L	C248
	CEA 101M 25L	C242,C249
	CEA 101M 10L	C215, C217, C219, C221, C223, C225, C258–C260, C251
	CEA 472M 6L	C252,C253
	CEA 6R8M 50L	C233
	CEA 3R3M 50L	C234
	CEA 010M 50L	C267,C268
	CEA 100M 16L	C201, C202, C256, C257, C261–C264, C276–C279
	CEANP 2R2M 50	C275
	CEA R68M 50L	C273, C274
	CQMA 473K 50	C203,C204,C231,C232,C255
	CQMA 392K 50	C205,C206
	CKDYB 471K 50	C207,C208
	CKDYB 102K 50	C209,C210
	CCDSL 271J 50	C211–C214
	CCDSL 101J 50	C236,C239,C245
	CKDYB 103K 50	C227
	CKDYB 152K 50	C228,C229
	CKDYB 222K 50	C265,C266
	CEANL 0R1M 50	C254
	CEA 332M 16L	C250,C280
	CCDSL 100D 50	C281–C284

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
⚠	RD¼PMF □□□ J	R251, R256, R266, R267, R271, R272
	RS2P □□□ J	R301,R302
	RD¼PM □□□ J	R201–R250, R252–R255, R257–R265, R268–R270, R273–R300, R303–R306

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	NJM4558DV	Q201,Q202,Q206,Q224
★★	PA4008	Q203
★★	PA5004	Q204,Q205,Q208
★★	TC4069UBP	Q209
★★	TA7318P-A	Q207
★★	μPC78M05H	Q220,Q222
★★	μPC78M12H	Q216
★★	μPC78M15H	Q217
★★	2SA839A	Q213
★★	2SA1115/A/	Q218
★★	2SB507P	Q215
★★	2SB764	Q221,Q223
★★	2SB834	Q219
★★	2SC1890A	Q214
★★	2SC2603/A/	Q210,Q211
★★	2SD313P	Q212
★	1S2471	D203,D212,D213
★	1S1555 (US1035)	D201, D202, D204, D206, D208, D209, D216–D223, D227, D228
★	1B4B1-LC2	D215
★	1G4B1-LC2	D214
★	SIB01-02	D210,D211,D224–D226
★	MZ-056	D205,D207

OTHERS

Mark	Part No.	Symbol & Description
★★	ASG-310	S201 3-ganged push swich (MONO/MUTE OFF, TUNING)
★★	ASX-184	S202 3-ganged push switch (SUBSONIC, MEMORY, MM/MC-remote)
★★	ASG-311	S203 3-ganged push switch (SPEAKERS, CLOCK)
	PBZ30P060FMC	Screw 3 x 6

Headphones Jack Assembly

Mark	Part No.	Symbol & Description
	AKN-030	Phone jack (PHONES)

Terminal Assembly

Mark	Part No.	Symbol & Description
	AKB-078	Terminal (PRE OUT/POWER AMP IN)

Rectifier Assembly (AWR-236)

CAPACITORS

Mark	Part No.	Symbol & Description
	ACG-019	C1,C2 Ceramic (0.01/150V)
	ACH-209	C3,C4 Electrolytic (12000/63V)

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RS2P 103J	R1,R2

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
⚠ ★	S5151	D1
⚠ ★	S5151R	D2
⚠ ★	STV2H-O	D3,D4

Power Amplifier Assembly (AWH-113)

CAPACITORS

Mark	Part No.	Symbol & Description
	CQMA 823K 50	C137,C138
	CQMA 332K 250	C113,C114
	CKDYB 472K 50	C135,C136
⚠	CCDSL 331K 500	C121,C122,C127,C128
	CCDSL 470J 50	C105–C108
	CCDSL 820J 50	C109–C112
	CCDSL 221J 50	C103,C104
	ACG-009	C131–C134,C141 Ceramic (0.047/150V)
	CEANL 4R7M 50	C101,C102
	CEA 471M 6L	C139
	CEA 101M 25L	C140
	CEANP R22M 50	C129,C130

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	ACP-062	VR1,VR2 Semi-fixed (470k-B)
★	ACP-019	VR3,VR4 Semi-fixed (100-B)
★	ACP-010	VR5,VR6 Semi-fixed (100k-B)
⚠	ACN-114	R185,R186 Wire wound (0.47 + 0.47/5W + 5W)
⚠	RS2P □□□ J	R189,R190
⚠	RS1P □□□ J	R121,R122,R143,R144
⚠	RS1PF □□□ J	R187,R188
	RD½PS □□□ J	R196
⚠	RD¼PMFL □□□ J	R131–R138
⚠	RD¼PMF □□□ J	R109, R110, R113, R114, R117, R118, R123, R124, R127–R130, R139–R142, R147, R148, R153–R156, R159–R164, R171, R172, R183
	RD¼PM □□□ J	R101–R108, R111, R112, R115, R116, R119, R120, R125, R126, R145, R146, R149–R152, R157, R158, R167–R170, R179–R182, R191–R194, R199–R201

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SC1775A-E*	Q101,Q102
★★	or 2SC1775A-F*	
★★	2SA979-F*	Q103,Q104
★★	or 2SA979-G*	

*hfe of Q101 and Q102 should have the E-rank, if Q103 and Q104 have the F-rank.

*hfe of Q101 and Q102 should have the F-rank, if Q103 and Q104 have the G-rank.

Mark	Part No.	Symbol & Description
★★	2SC1915	Q109,Q110
★★	2SC1914A	Q123,Q124
⚠ ★★	2SC2275A-P* (2SC2275A-Q*)	Q133,Q134
⚠ ★★	2SA985A-P* (2SA985A-Q*)	Q135,Q136

*hfe of these transistors (Q133–Q136) should have the same value.

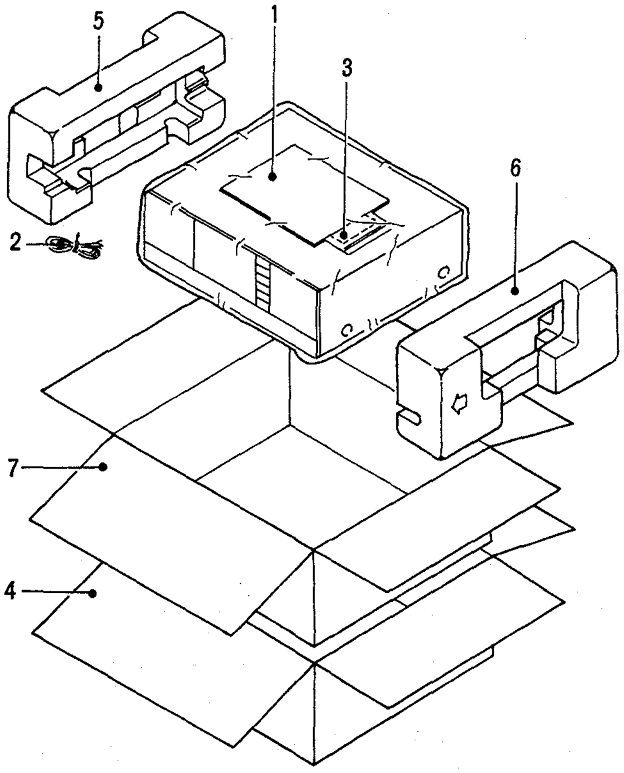
Mark	Part No.	Symbol & Description
★★	2SC2603/A/	Q113, Q114, Q119, Q120, Q125, Q126, Q137, Q138
★★	2SC2291	Q105,Q106
★★	2SA992-E	Q107,Q108
★★	2SA904A	Q121,Q122
★★	2SA905	Q115,Q116
★★	2SA1115/A/	Q111,Q112,Q117,Q118,Q139
★★	2SD438	Q140
★	WZ-061 (MZ-061)	D101–D106
★	KZL140	D131
★	1S1555 (US1035)	D113–D116
★	WZ-046	D135,D136
★	1S2471	D129,D130,D132,D134
★	10E2	D111,D112,D117,D118
★	TH103-2	Th101,Th102

OTHERS

Mark	Part No.	Symbol & Description	
★★	ASR-068	RL1	Relay
	PBZ30P060FMC	Screw	3 x 6

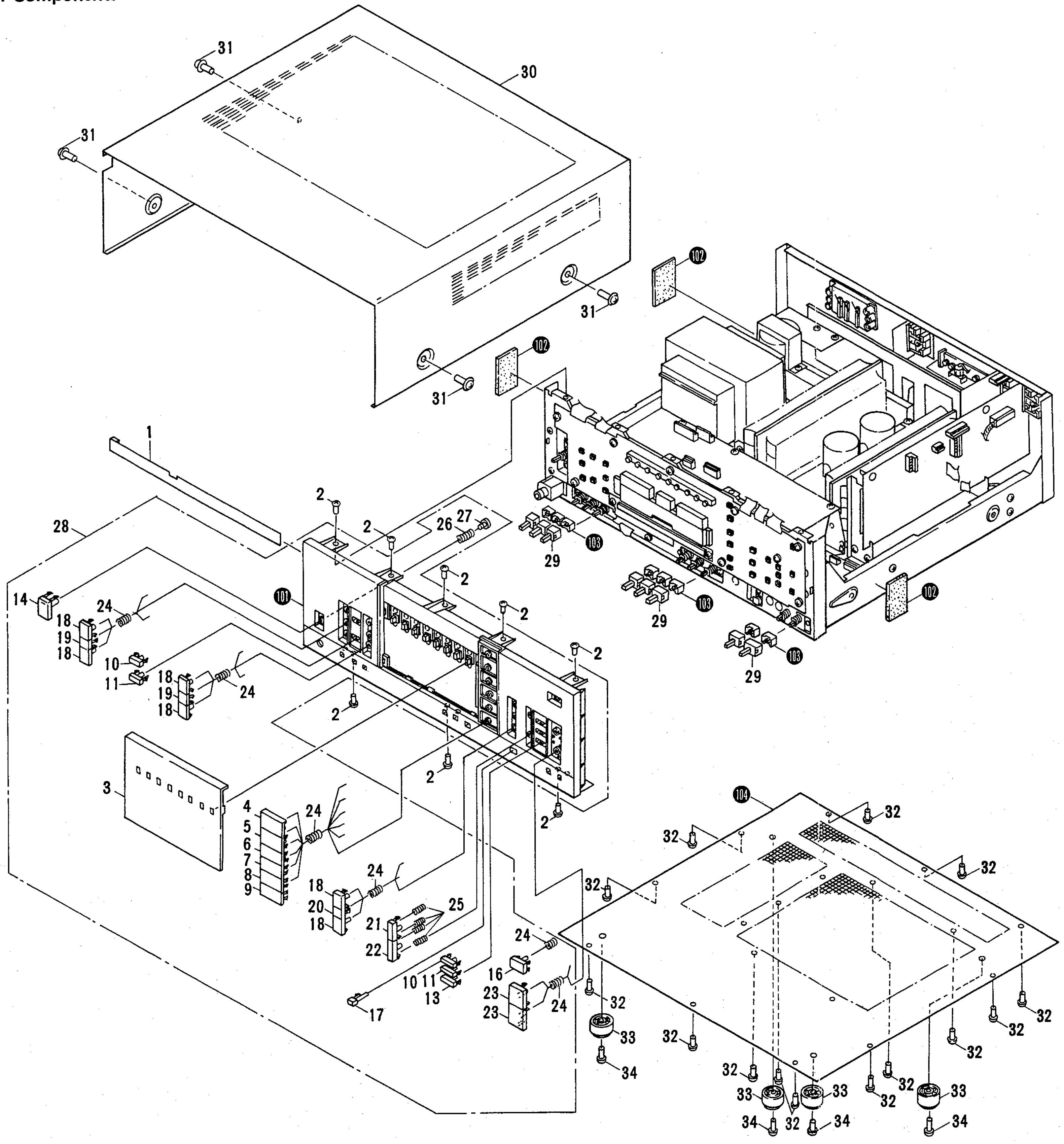
8. PACKING

Mark	No.	Part No.	Description
	1.	ARB-467	Operating instructions
	2.	ADH-004	T-type FM antenna
	3.	AAN-028	Station card set
	4.	AHE-019	Packing case
	5.	AHA-313	Side pad L
	6.	AHA-314	Side pad R
	7.	AHC-063	Inside packing



9. EXPLODED VIEW

Exterior Components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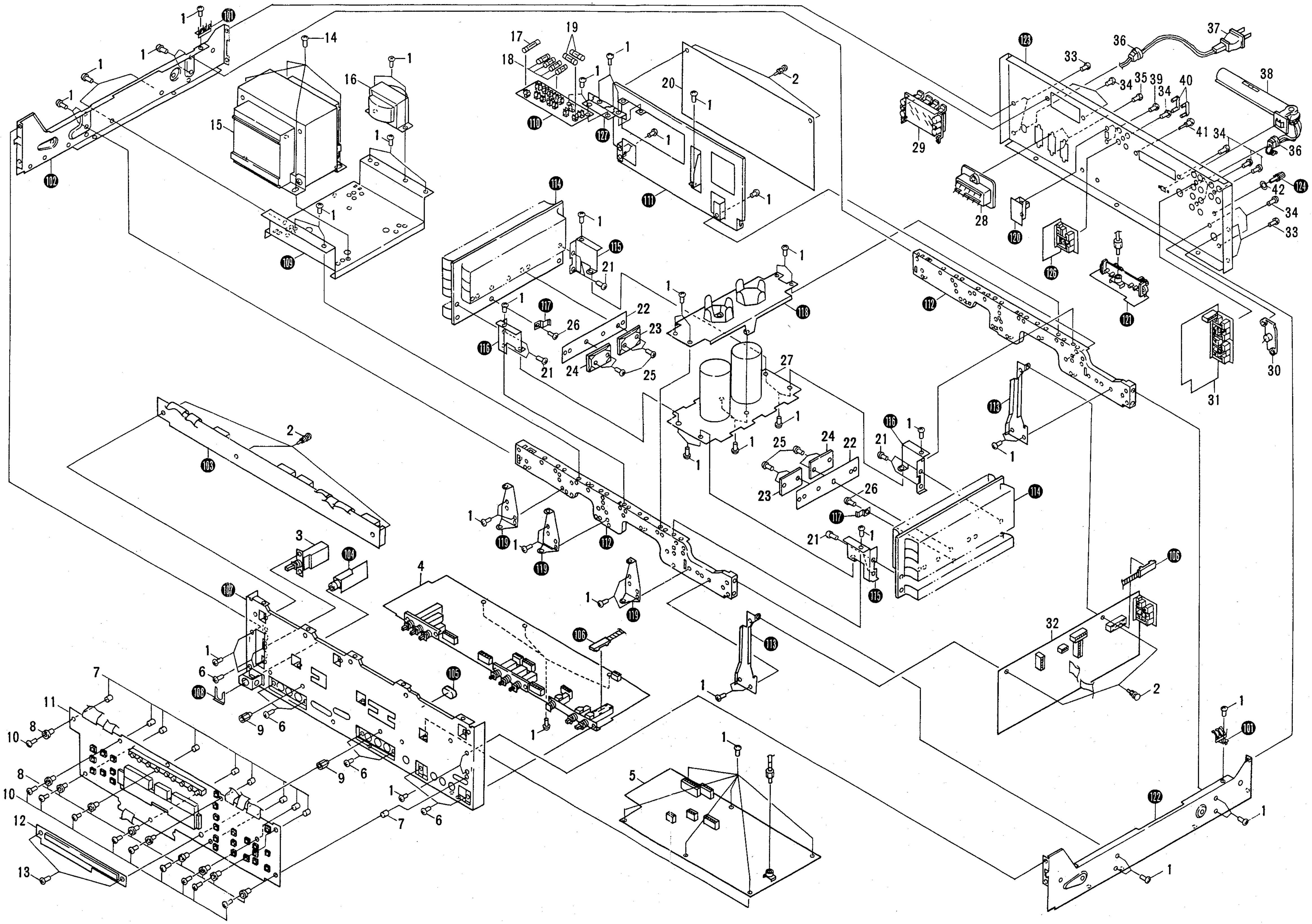
NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Description
	1.	ANR-450	Slider assembly
	2.	VMZ30P060FMC	Screw 3 x 6
	3.	ANR-491	Display cover
	4.	AAD-457	Knob (FM)
	5.	AAD-458	Knob (AM)
	6.	AAD-459	Knob (PHONO)
	7.	AAD-460	Knob (AUX/VIDEO)
	8.	AAD-461	Knob (TAPE 1)
	9.	AAD-462	Knob (TAPE 2)
	10.	AAD-463	Knob (PRESET A)
	11.	AAD-464	Knob (PRESET B)
	12.	.....	
	13.	AAD-466	Knob (LOUDNESS)
	14.	AAD-467	Knob (POWER)
	15.	.....	
	16.	AAD-469	Knob (MUTING)
	17.	AAD-470	Knob (MEMORY)
	18.	AAD-471	Knob (TONE, TUNING)
	19.	AAD-472	Knob (TONE, FLAT)
	20.	AAD-473	Knob (STOP)
	21.	AAD-474	Knob (BALANCE L)
	22.	AAD-475	Knob (BALANCE R)
	23.	AAD-476	Knob (VOLUME)
	24.	ABH-091	Coiled spring
	25.	ABH-092	Coiled spring
	26.	ABH-093	Coiled spring
	27.	AEC-875	Stopper
	28.	ANM-117	Front panel assembly
	29.	AAD-484	Knob
	30.	ANE-380	Top cover
	31.	ABA-193	Screw 4 x 8
	32.	VBZ30P060FMC	Screw 3 x 6
	33.	AEC-083	Foot assembly
	34.	VTZ40P100FMC	Screw 4 x 10
	35.	.....	
	101.		Front panel
	102.		Cushion
	103.		Flexible joint
	104.		Bottom plate

Interior Components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NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Description
	1.	VBZ30P060FMC	Screw 3 x 6
	2.	AEC-352	Nylon rivet
⚠ ★★	3.	ASG-534	Push switch (POWER)
	4.	GWM-229	TC/Power supply assembly
	5.	GWE-178	Tuner assembly
	6.	VMZ30P060FMC	Screw 3 x 6
	7.	AEC-883	Collar
	8.	AEC-884	Bush
	9.	ABN-068	Stud
	10.	VBZ30P160FMC	Screw 3 x 16
	11.	GWK-196	Control assembly
★	12.	AAV-306	LED level meter module
	13.	BMT30P050FZK	Screw 3 x 5
	14.	VTZ40P080FMC	Screw 4 x 8
⚠ ★	15.	ATT-882	Power transformer
⚠ ★	16.	ATT-883	Power transformer
⚠ ★★	17.	AEK-304	Fuse (8A)
⚠ ★★	18.	AEK-122	Fuse (2A)
⚠ ★★	19.	AEK-119	Fuse (1A)
	20.	AWH-113	Power amplifier assembly
	21.	VBZ30P080FMC	Screw 3 x 8
	22.	AEC-885	Mica wafer
⚠ ★★	23.	2SA1216-G or O or Y*	(Q1, Q2)
⚠ ★★	24.	2SC2922-G or O or Y*	(Q3, Q4)
	25.	ABA-258	Screw with washer

* hfe of these transistors (Q1—Q4) should have the same value.

Mark	No.	Part No.	Description
	26.	ABA-234	Screw with washer 3 x 12
	27.	AWR-236	Rectifier assembly
⚠	28.	AKP-041	AC socket (AC OUTLETS)
	29.	AKE-105	Terminal (SPEAKERS)
	30.	AKB-076	Terminal (AM STEREO OUT)
	31.	GWS-392	Tape terminal assembly
	32.	GWF-148	EQ/Function assembly
	33.	BBT30P080FZK	Screw 3 x 8
	34.	BBZ30P100FZK	Screw 3 x 10
	35.	MTZ30P100FZK	Screw 3 x 10
	36.	AEC-327	Strain relief
⚠	37.	ADG-052	AC power cord
	38.	ATB-638	Bar-antenna assembly
	39.	PMZ30P050FZB	Screw 3 x 5
	40.	AKM-041	Jumper plug

Mark	No.	Part No.	Description
	41.	ABA-115	Terminal screw
	42.	WA35F100N080	Flat washer
	43.	......	
	44.	......	
	45.	......	
	101.		Ground terminal 7-P
	102.		Side frame L
	103.		Connector assembly
	104.		Headphones jack assembly
	105.		Cushion
	106.		Remote belt
	107.		Panel stay
	108.		Stopper
	109.		Transformer frame
	110.		Fuse holder assembly
	111.		P. C. board holder
	112.		Center frame
	113.		P. C. board holder
	114.		Heat sink
	115.		Heat sink holder B
	116.		Heat sink holder A
	117.		Varistor holder
	118.		Capacitors holder
	119.		P. C. board holder
	120.		Switch assembly
	121.		Antenna terminal assembly
	122.		Side frame R
	123.		Rear panel
	124.		Terminal (GND)
	125.		....
	126.		Terminal assembly

10. ADJUSTMENTS

Power Amplifier Section

- Turn VR3, VR5 (L) and VR4, VR6 (R) fully around in the counter-clockwise direction, but set VR1 (L) and VR2 (R) to the center positions.
- Without any load or input signal, turn the POWER switch ON.

Adjustment point	Prescribed value	Measuring terminals
DC Balance		
VR1 (L)	DC 0V ±30mV	Output terminals (SPEAKERS)
VR2 (R)	DC 0V ±30mV	
Idle Current		
VR3 (L)	DC 56mV	JP1 (+) and JP2 (–)
VR5 (L)	DC 70mV	
VR4 (R)	DC 56mV	JP4 (+) and JP3 (–)
VR6 (R)	DC 70mV	

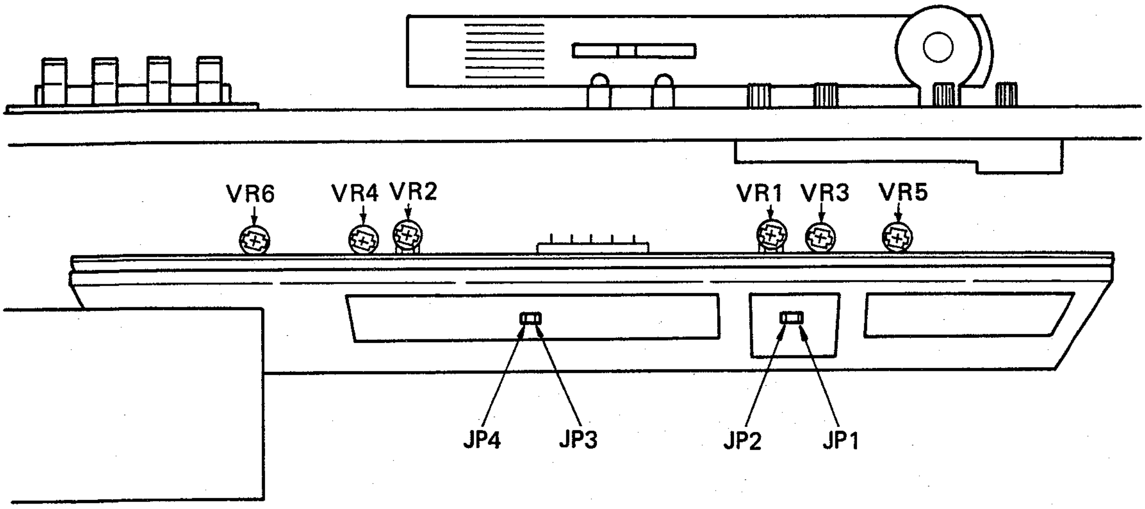


Fig. 10-1

FM Tuner Section

- Connect the FM signal generator (FM SG) to the FM ANTENNA 300Ω terminal through a 300Ω dummy antenna.
- Set the AUTO/MANUAL switch to the MANUAL position, the FM (FUNCTION) switch to the ON position and the MODE MONO (MUTE OFF) switch to the MONO (MUTE OFF) position.

(*1) Tune the FM SG to the SX-8.

(*2) Connect the FM multiplex stereo signal generator to the FM SG external modulator terminal. Set the modulation to Pilot 19kHz/±7.5kHz deviation only.

(*3) Connect the FM multiplex stereo signal generator to the FM SG external modulator terminal. Set the modulation to Main 1kHz/L +R/±67.5kHz deviation, Pilot 19kHz/±7.5kHz deviation.

Step	FM SG (400Hz, ±75kHz deviation)		SX-8 Frequency display	Adjustment point	Adjustment procedure
	Frequency	Level			
1.	No signal		87.5MHz	L6	7.2V DC between terminal no. 9 and ground.
2.	No signal		108.0MHz	TC4	24V DC between terminal no. 9 and ground.
3.	Repeat steps 1 and 2 until both specifications are correct.				
4.	90.0MHz (*1)	60dB	90.0MHz	L1,L2,L3	Adjust until DC voltage between terminal no. 17 and ground is maximum.
5.	106.0MHz (*1)	60dB	106.0MHz	TC1,TC2,TC3	
6.	Repeat steps 4 and 5 until maximum sensitivity is attained.				
7.	98.0MHz (*1)	60dB	98.0MHz	T1	Adjust until DC voltage between terminal no. 17 and ground is maximum.
8.	98.000MHz**	60dB	98.0MHz	T2 (CENTER)	0V DC between terminal no. 10 and no. 11.
9.	98.000MHz**	60dB	98.0MHz	T2 (DIST)	Adjust until distortion at TAPE 1 REC terminal is minimum.
10.	Repeat steps 8 and 9 until both requirements are satisfied.				
11.	Set the MODE MONO switch to the STEREO position.				
12.	98.0MHz (*1)	60dB (not modulation)	98.0MHz	VR2	Adjust signal at terminal no.1 to 76kHz (± 500Hz)
13.	98.0MHz (*1) Set to pilot modulation (*2)	60dB	98.0MHz	VR3	Adjust so that a leakage of 19kHz at TAPE 1 REC terminal is balanced between R and L channels and minimized at the same time.
14.	98.0MHz (*1) Set to stereo modulation (*3)	60dB	98.0MHz	T1 (within ±90°)	Adjust until distortion at TAPE 1 REC L or R terminal is minimum.
15.	98.0MHz (*1) Set to stereo modulation (*3)	31dB	98.0MHz	VR1	Obtain a position just prior to activation of the muting circuit and light up the STEREO indicator.

**Frequency must be accurate.

AM Tuner Section

- Connect the AM signal generator (AM SG) to the AM ANTENNA terminal through a 10kΩ resistor.
- Set the AM (FUNCTION) switch to the ON position and AM CHANNEL STEP switch (on the rear panel) to 10kHz position.

(*4) Tune the AM SG to the SX-8.

Step	AM SG (400Hz, 30% modulation)		SX-8 Frequency display	Adjustment point	Adjustment procedure
	Frequency	Level			
1.	No signal		520kHz	T4	2V DC between terminal no. 9 and ground.
2.	No signal		1620kHz	TC7	24V DC between terminal no. 9 and ground.
3.	Repeat steps 1 and 2 until both specifications are correct.				
4.	600kHz (*4)	40dB	600kHz	Bar-antenna	Adjust until DC voltage between terminal no. 17 and ground is maximum.
5.	1400kHz (*4)	40dB	1400kHz	TC6	
6.	Repeat steps 4 and 5 until maximum sensitivity is attained.				

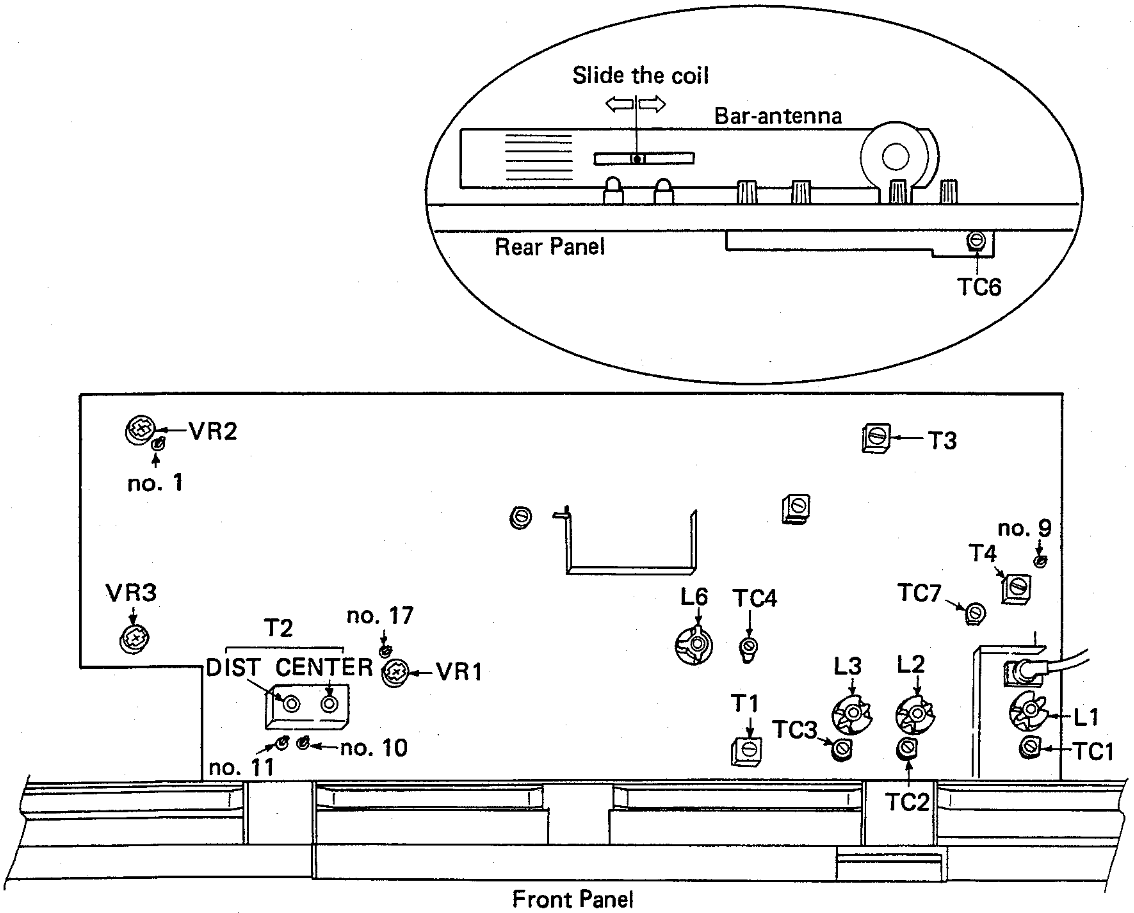

Slide the coil
Bar-antenna
Rear Panel
TC6
VR2
no. 1
T3
no. 9
T4
VR3
T2
no. 17
DIST CENTER
VR1
L6
TC4
TC7
L3
L2
T1
TC3
L1
TC1
no. 10
no. 11
TC2
Front Panel

Fig. 10-2

10. RÉGLAGE

Section d'amplificatuer de puissance

- Tourner VR3, VR5 (gauche) et VR4, VR6 (droite) à fond au sens contraire du mouvement des aiguilles d'une montre, mais laisser VR1 (gauche) et VR2 (droite) sur la position centrale.
- Régler l'interrupteur général sur ON sans appliquer de charge ou de signal d'entrée.

Point de réglage	Valeur prescrite	Bornes de mesure
	Balance CC	
VR1 (gauche)	0V ± 30 mV, CC	Bornes de sortie (SPEAKERS)
VR2 (droite)	0V ± 30 mV, CC	
	Courant déwatté	
VR3 (gauche)	56 mV, CC	JP1 (+) et JP2 (–)
VR5 (gauche)	70 mV, CC	
VR4 (droite)	56 mV, CC	JP4 (+) et JP3 (–)
VR6 (droite)	70 mV, CC	

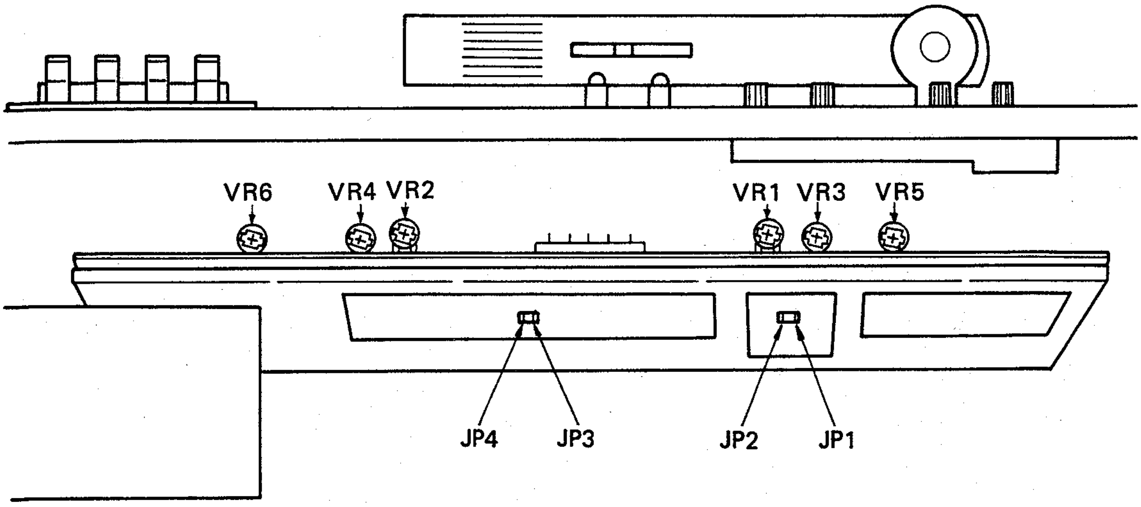


Fig. 10-1

Section de Tuner FM

- Raccorder le générateur de signaux (FM SG) sur la borne de l'antenne FM (FM ANTENNA) 300Ω par l'intermédiaire d'une antenne factice 300Ω.
- Régler le commutateur AUTO/MANUAL sur la position MANUAL, le commutateur FM (FUNCTION) sur la position ON et le commutateur MODE MONO (MUTE OFF) sur la position MONO (MUTE OFF).

(*1) Accorder le générateur de signaux FM sur SX-8.

(*2) Raccorder le générateur de signaux FM stéréo multiplex sur la borne du modulateur externe FM SG. Régler la modulation sur déviation pilote 19 kHz/±7,5 kHz seulement.

(*3) Raccorder le générateur de signaux FM stéréo multiplex sur la borne du modulateur externe FM SG. Régler la modulation sur déviation principale 1 kHz/gauche+droit (L+R)/±67,5 kHz, déviation de synchronisation 19 kHz/± 7,5 kHz.

Phase	FM SG (400Hz, ±75kHz déviation)		Affichage de fréquence SX-8	Point de réglage	Procédure de réglage
	Fréquence	**Niveau**			
1	Pas de signal		87,5MHz	L6	7.2V CC entre la borne nº 9 et la borne de terre.
2	Pas de signal		108,0MHz	TC4	24V CC entre la borne nº 9 et la borne de terre.
3	Répéter les phases 1 et 2 afin d'obtenir les deux caractéristiques correctes.				
4	90,0MHz (*1)	60dB	90,0MHz	L1, L2, L3	Régler afin d'obtenir la tension CC maximum entre la borne nº 17 et la borne de terre.
5	106,0MHz (*1)	60dB	106,0MHz	TC1, TC2, TC3	
6	Répéter les phases 4 et 5 afin d'obtenir la sensibilité maximum.				
7	98,0MHz (*1)	60dB	98,0MHz	T1	Régler afin d'obtenir la tension CC maximum entre la borne nº 17 et la borne de terre.
8	98,000MHz**	60dB	98,0MHz	T2 (CENTRE)	0V CC entre la borne nº 10 et la borne nº 11.
9	98,000MHz**	60dB	98,0MHz	T2 (DIST)	Régler afin d'obtenir la distorsion minimum à la borne TAPE 1 REC.
10	Répéter les phases 8 et 9 afin d'obtenir les deux conditions requises.				
11	Régler le commutateur MODE MONO sur la position STEREO.				
12	98,0MHz (*1)	60dB (pas de modulation)	98,0MHz	VR2	Régler le signal à la borne nº 1 to 76 kHz (±500 Hz).
13	98,0MHz (*1) Régler sur modulation pilote (*2).	60dB	98,0MHz	VR3	Régler de sorte que la fuite de 19 kHz à la borne REC de TAPE 1 soit équilibrée entre les canaux R et L, et réduite au minimum en même temps.
14	98,0MHz (*1) Régler sur modulation stéréo (*3).	60dB	98,0MHz	T1 (entre ±90°)	Régler afin d'obtenir la distorsion minimum à la borne TAPE 1 REC L ou R.
15	98,0MHz (*1) Régler sur modulation stéréo (*3).	31dB	98,0MHz	VR1	Régler sur la position précédant l'excitation du circuit d'atténuation el allumant l'indicateur STEREO.

**La fréquence doit être précise.

10. AJUSTE

Sección de amplificador de potencia

- Girar completamente VR3, VR5 (izq.) y VR4, VR6 (der.) en el sentido del movimiento de las manecillas del reljo, pero dejar VR1 (iqz.) y VR2 (der.) en la posición central.
- Sin ninguna carga ni señal de entrada, poner el interruptor de la alimentación (POWER) en la posición ON.

Punto de ajuste	Valor prescrito	Terminales de medición
Equilibrio de CC		
VR1 (izq.)	0V ± 30 mV, CC	Terminales de salida (SPEAKERS)
VR2 (der.)	0V ± 30 mV, CC	
Corriente devatiada		
VR3 (izq.)	56 mV, CC	JP1 (+) y JP2 (–)
VR5 (izq.)	70 mV, CC	
VR4 (der.)	56 mV, CC	JP4 (+) y JP3 (–)
VR6 (der.)	70 mV, CC	

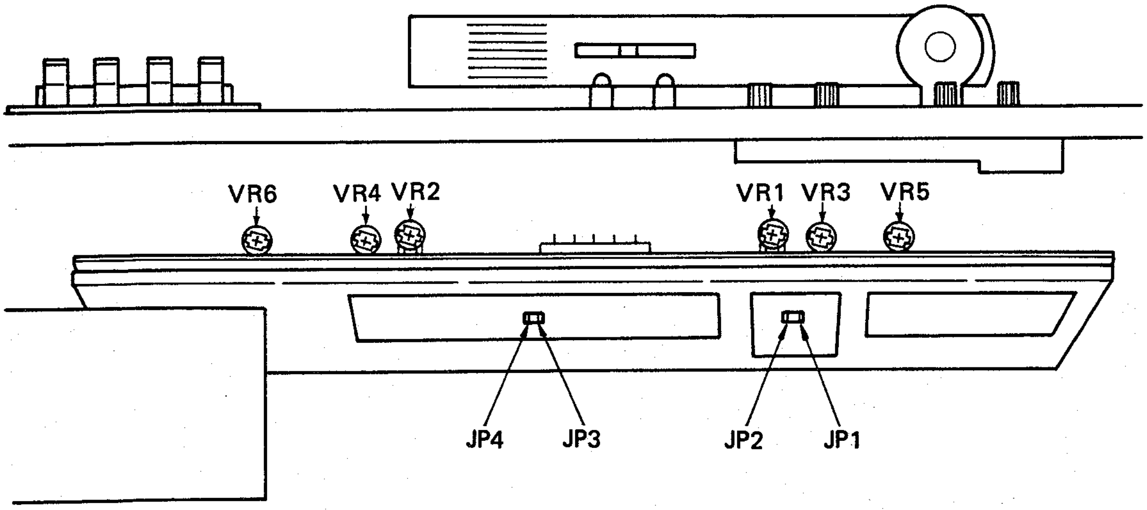


Fig. 10-1

Section de Tuner AM

- Raccorder le générateur de signaux AM (AM SG) sur la borne d'antenne AM (AM ANTENNA) par l'intermédiaire d'un résisteur de 10KΩ.
- Régler le commutateur AM (FUNCTION) sur la position ON et le commutateur AM CHANNEL STEP (situé sur le panneau arrière) sur la position 10kHz.

(*4) Accorder le générateur de signaux AM SG sur SX-8.

Phase	AM SG (400Hz, 30% modulation)		Affichage de fréquence SX-8	Point de réglage	Procédure de réglage
	Fréquence	Niveau			
1	Pas de signal		520kHz	T4	2V CC entre la borne n° 9 et la borne de terre.
2	Pas de signal		1620kHz	TC7	24V CC entre la borne n° 9 et la borne de terre.
3	Répéter les phases I et 2 afin d'obtenir les deux caractéristiques correctes.				
4	600kHz (*4)	40dB	600kHz	Antenne -tige	Régler afin d'obtenir la tension CC maximum entre la borne n° 17 et la borne de terre.
5	1400kHz (*4)	40dB	1400kHz	TC6	
6	Répéter les phases 4 et 5 afin d'obtenir la sensibilité maximum.				

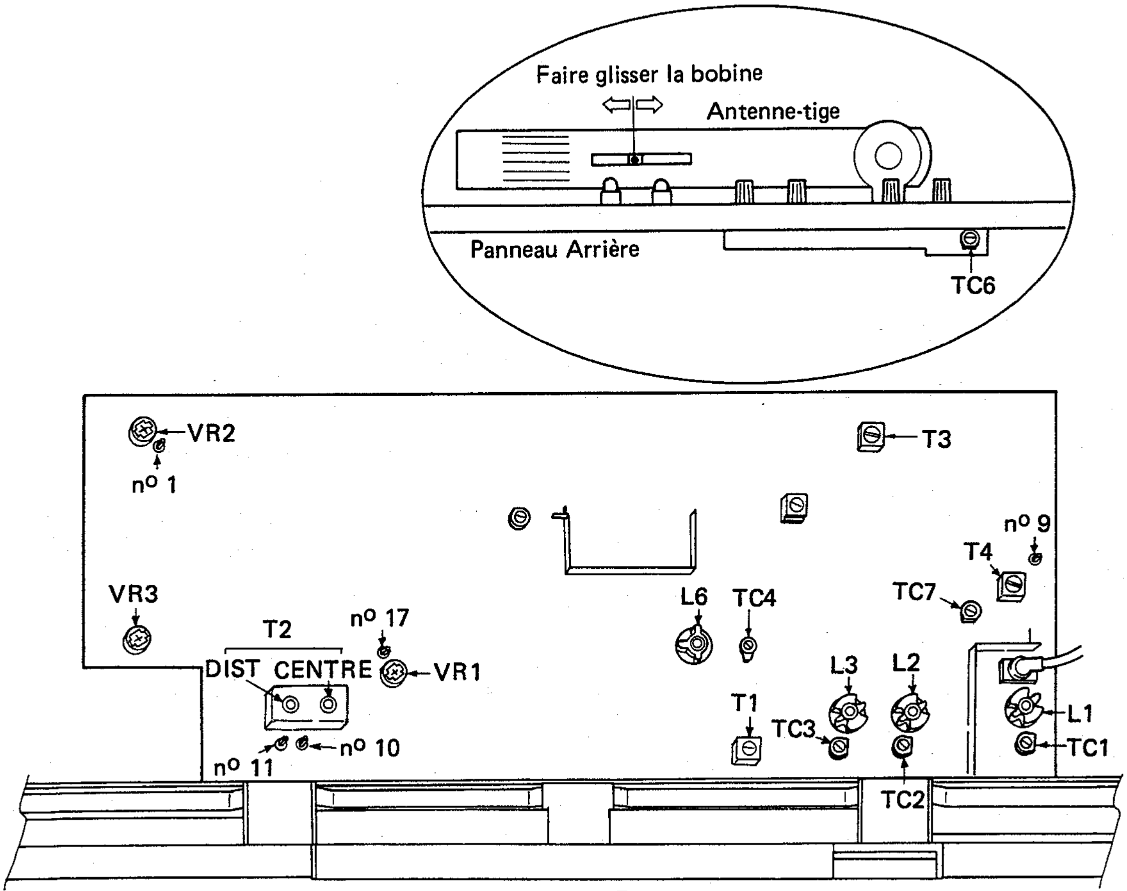

Faire glisser la bobine
Antenne-tige
Panneau Arrière
TC6
VR2
n° 1
T3
n° 9
T4
TC7
VR3
T2
n° 17
DIST CENTRE
VR1
L6
TC4
L3
L2
T1
TC3
L1
TC1
n° 10
n° 11
TC2
Panneau de Face

Fig. 10-2

Sección de Sintonizador de FM

- Conectar el generador de señales de FM (FM SG) al terminal FM ANTENNA 300Ω a través de una antena ficticia de 300ohmios.
- Conectar el selector AUTO/MANUAL en la posición MANUAL, el selector de función de FM en la posición ON y el de modo de MONO (MUTE OFF) en la posición MONO (MUTE OFF).

(*1) Sintonizar el FM SG con el SX-8.

(*2) Conectar un generador de señales estereofónicas de FM multiplex al terminal modulador exterior del FM SG.
Ajustar la modulación a Piloto 19 kHz/±7,5 kHz de desviación solamente.

(*3) Conectar un generador de señales estereofónicas de FM multiplex al terminal modulador exterior del FM SG.
Ajustar la modulación a Principal 1 kHz/Izq. + Der. (L+R)/±67,5 kHz de desviación; Piloto 19kHz/±7,5 kHz de desviación.

Paso	FM SG (400Hz, ±75kHz desviación)		Frecuencímetro del SX-8	Punto de ajuste	Procedimientos de ajuste
	Frecuencia	Nivel			
1	Sin señal		87,5MHz	L6	7.2V CC entre el terminal no. 9 y masa.
2	Sin señal		108,0MHz	TC4	24V CC entre el terminal no. 9 y masa.
3	Repetir los pasos 1 y 2 hasta que ambas especificaciones sean correctas.				
4	90,0MHz (*1)	60dB	90,0MHz	L1, L2, L3	Ajustar hasta que la tensión de CC entre el terminal no. 17 y masa sea la máxima.
5	106,0MHz (*1)	60dB	106,0MHz	TC1, TC2, TC3	
6	Repetir los pasos 4 y 5 hasta lograrse la máxima sensibilidad.				
7	98,0MHz (*1)	60dB	98,0MHz	T1	Ajustar hasta que la tensión de CC entre el terminal no. 17 y masa sea la máxima.
8	98,000MHz**	60dB	98,0MHz	T2 (CENTER)	0V CC entre el terminal no. 10 y el no. 11.
9	98,000MHz**	60dB	98,0MHz	T2 (DIST)	Ajustar hasta que la distorsión en el terminal TAPE 1 REC sea la mínima.
10	Repetir los pasos 8 y 9 hasta que se satisfagan ambos requisitos.				
11	Poner el selector MODE MONO en la posición STEREO.				
12	98,0MHz (*1)	60dB (sin modulación)	98,0MHz	VR2	Ajustar la señal en el terminal no. 1 to 76 kHz (±500 Hz).
13	98,0MHz (*1) Ajustar a modulación piloto(*2)	60dB	98,0MHz	VR3	Ajustar de manera tal que la fuga de 19 kHz en el terminal REC de TAPE 1 sea equilibrada entre los canales R y L, y minorizada al mismo teimpo.
14	98,0MHz (*1) Ajustar a modulación estereofónica (*3)	60dB	98,0MHz	T1 (dentro de ±90°)	Ajustar hasta que la distorsión en el terminal TAPE 1 REC L o R sea la mínima.
15	98,0MHz (*1) Ajustar a modulación estereofónica (*3)	31dB	98,0MHz	VR1	Obtener una posición anterior a la activación del circuito de silenciamiento y antes de que se ilumine el indicador STEREO.

**La frecuencia tiene que ser precisa.

Sección de Sintonizador de AM

- Conectar el generador de señales de AM (AM SG) al terminal AM ANTENNA a través de un resistor de 10Kohmios.
- Poner el selector de función de AM en la posición ON y el de AM CHANNEL STEP (del panel posterior) en la posición de 10kHz.

(*4) Sintonizar el AM SG con el SX-8.

Paso	AM SG (400Hz, 30% modulación)		Frecuencímetro del SX-8	Punto de ajuste	Procedimientos de ajuste
	Frecuencia	Nivel			
1	Sin señal		520kHz	T4	2V CC entre el terminal no. 9 y masa.
2	Sin señal		1620kHz	TC7	24V CC entre el terminal no. 9 y masa.
3	Repetir los pasos 1 y 2 hasta que ambas especificaciones sean correctas.				
4	600kHz (*4)	40dB	600kHz	Antena de barra	Ajustar hasta que la tensión de CC entre el terminal no. 17 y masa sea la máxima.
5	1400kHz (*4)	40dB	1400kHz	TC6	
6	Repetir los pasos 4 y 5 hasta logarse la máxima sensibilidad.				

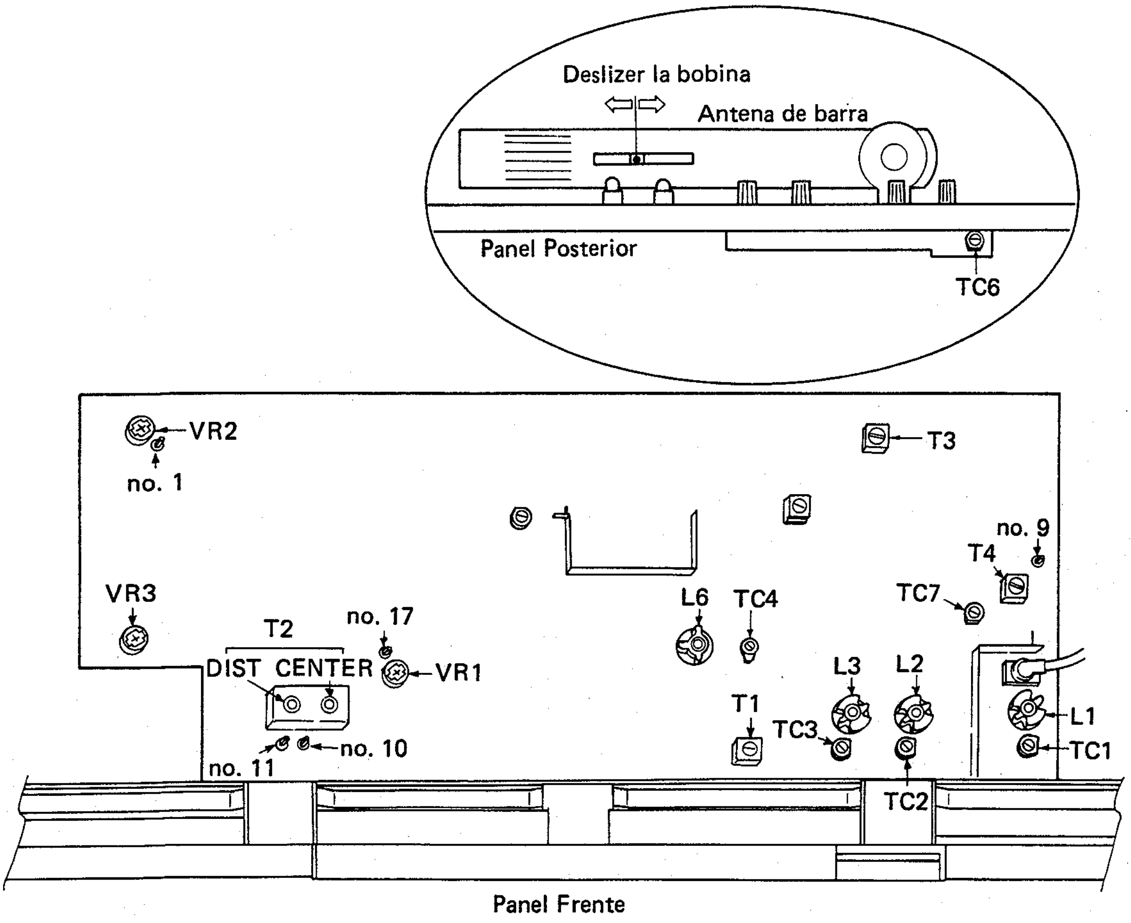

Deslizer la bobina
Antena de barra
Panel Posterior
TC6
VR2
no. 1
T3
no. 9
T4
VR3
TC7
T2
no. 17
L6
TC4
DIST CENTER
VR1
L3
L2
T1
TC3
L1
TC1
no. 10
no. 11
TC2
Panel Frente

Fig. 10-2

PIONEER

ADDITIONAL

Service Manual

COMPUTER CONTROLLED STEREO RECEIVER

SX-8 S, S/G

The basic performance of the S/G type (U.S. Military model) and S type (General export model) is the same as the KU type (U.S.A. model). This additional service manual is applicable to the S/G and S types, please refer to the KU type sercice manual (pp.1—44) with the exception of this supplement.

SPECIFICATIONS

The specifications for S/G and S types are the same as the KU type except for following sections:

Miscellaneous

Power Requirements	AC110/120/220/240V(Switchable), 50/60Hz
Power Consumption	225W
Weight (without package)	15.2kg (33 lb 8 oz)

Furnished Parts

Fuse	(8A) x 1 (4A) x 1

CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

ELECTRICAL PARTS

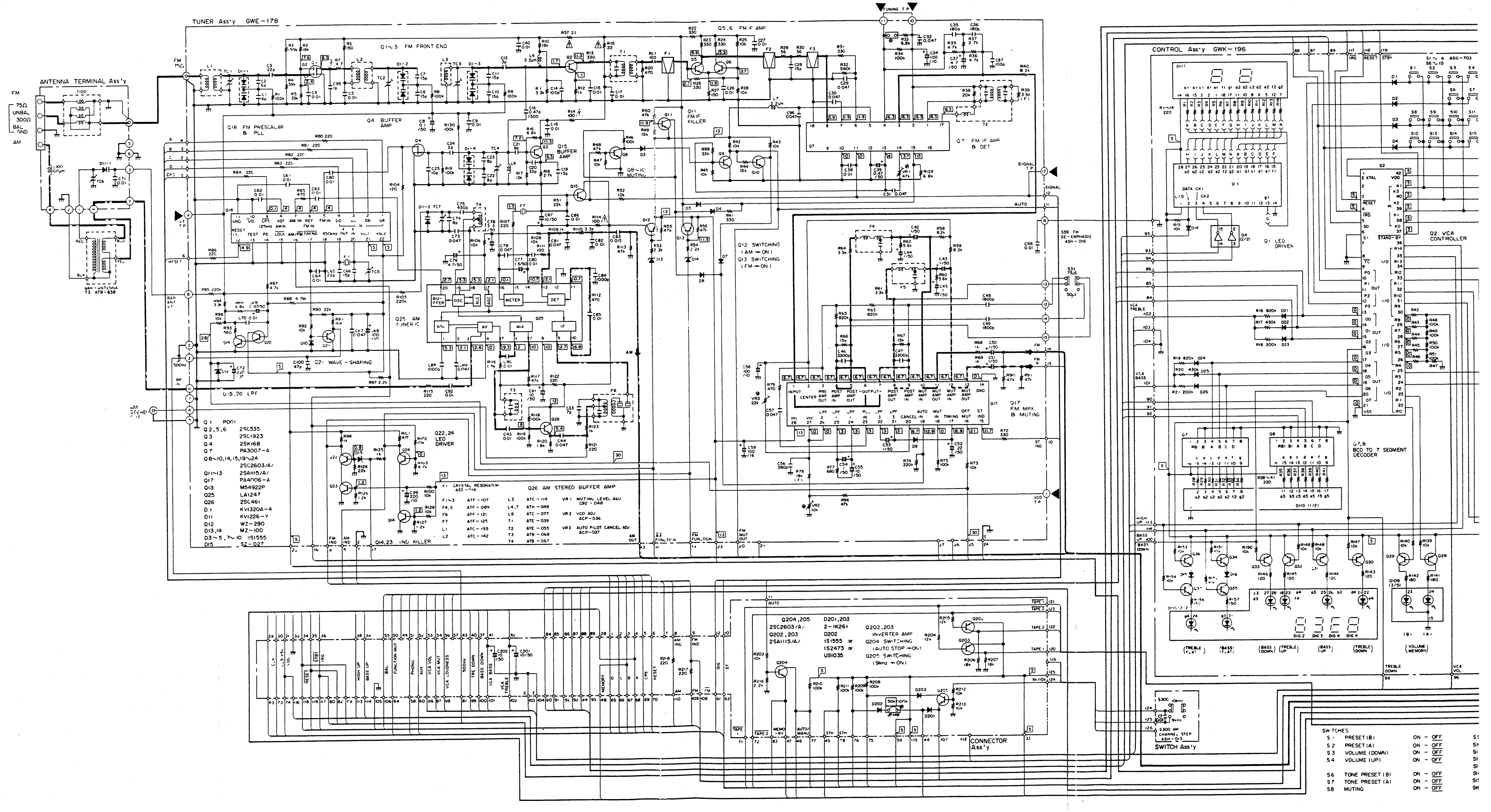
Mark	Symbol & Description	Part No.			Remarks
		KU type	S type	S/G type	
⚠ ★	T1 Power transformer (120V)	ATT-882	....	....	
	(110/120/220/240V)	....	ATT-888	ATT-888	
⚠ ★	T2 Power transformer (120V)	ATT-883	....	....	
	(110/120/220/240V)	....	ATT-887	ATT-887	
⚠ ★★	FU1 Fuse (8A)	AEK-304	(AEK-304)	AEK-304	110/120V
	Fuse (4A)	....	AEK-100	(AEK-100)	220/240V
⚠ ★★	S36 Push switch (POWER)	ASG-534	ASG-533	ASG-533	
⚠ ★★	S37 Line voltage selector	....	AKR-031	AKR-031	with fuse holder
⚠ ★★	S38 Line voltage selector	....	AKX-063	AKX-063	
★★	S39 Slide switch (DE-EMPHASIS)	....	ASH-016	ASH-016	
⚠	C1,C2 Ceramic capacitor	ACG-017	ACG-001	ACG-001	
⚠	R1 Carbon composition resistor (2.2M/½W)	ACN-029	....	....	
⚠	AC power cord	ADG-052	ADG-049	ADG-049	

PACKING AND FURNISHED PARTS

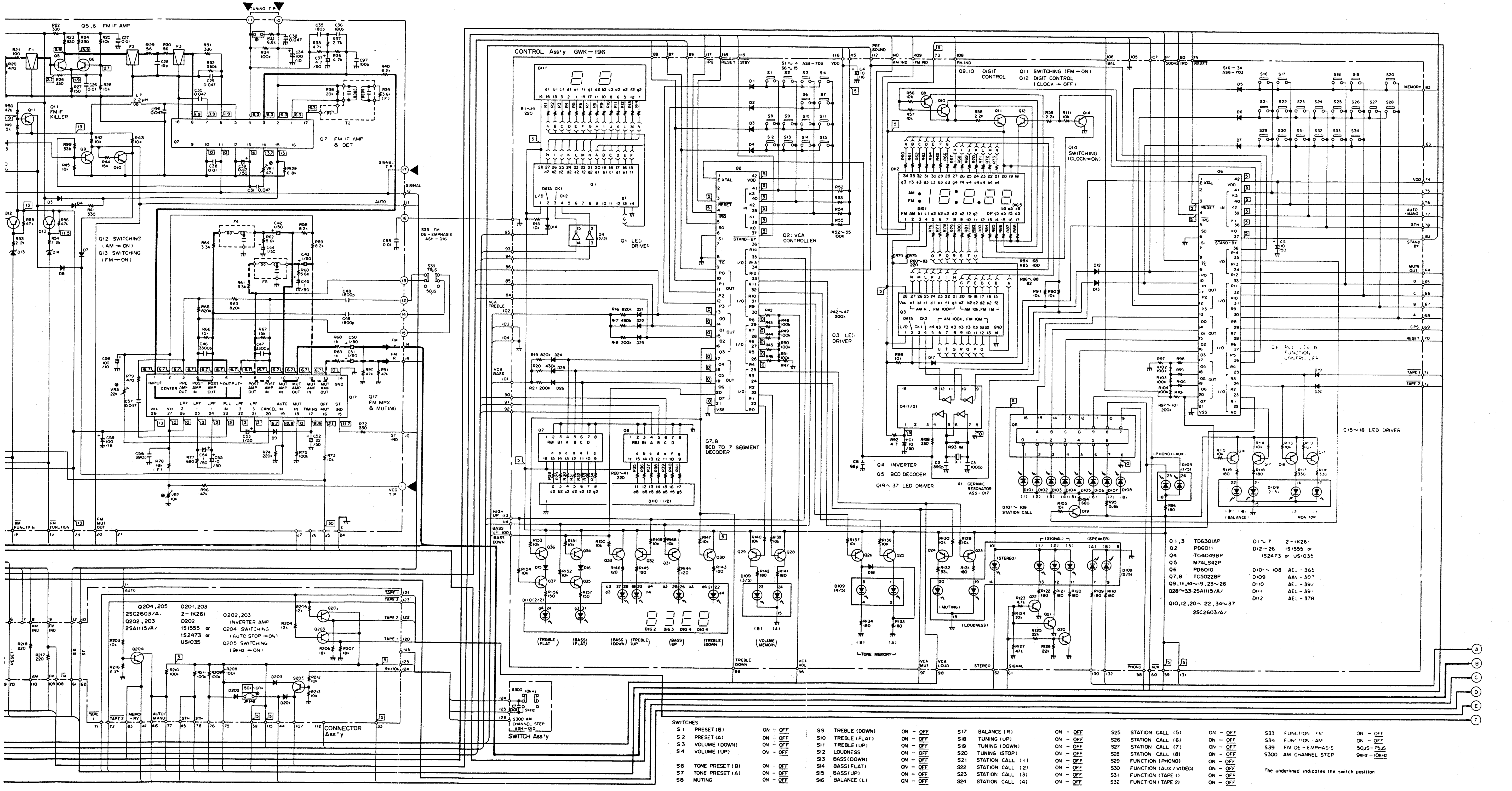
Mark	Symbol & Description	Part No.			Remarks
		KU type	S type	S/G type	
	Packing case	AHE-019	AHE-019	AHE-021	
	Inside packing	AHC-063	AHC-063	AHC-064	
	Cardboard spacer	....	....	AHB-111	
	Operating instructions	ARB-467	ARB-468	ARB-468	
	Station card set	AAN-028	AAN-029	AAN-029	
⚠ ★★	Fuse (8A)	....	AEK-304	AEK-304	
⚠ ★★	Fuse (4A)	....	AEK-100	AEK-100	

- **When replacing the tuner assembly (GWE-178) of S and S/G types, cut the resistor R33 (connected in parallel with R34).**

SCHEMATIC DIAGRAM FOR S AND S/G TYPES(1/2)


1
2
3
4
5
6
A
B
C
D
TUNER Ass'y GWE-178
ANTENNA TERMINAL Ass'y
FM 75Ω UNBAL 300Ω BAL GND AM
BAR-ANTENNA T3 ATB-638
Q1~3 FM FRONT END
Q4 BUFFER AMP
Q5,6 FM IF AMP
Q11 FM IF KILLER
Q8~10 MUTING
Q15 BUFFER AMP
Q18 FM PRESCALAR & PLL
Q7 FM IF AMP & DET
TUNING T.P
SIGNAL T.P
VCO T.P
S39 FM DE-EMPHASIS ASH-016
Q12 SWITCHING (AM→ON)
Q13 SWITCHING (FM→ON)
Q17 FM MPX & MUTING
Q25 AM TUNER IC
Q21 WAVE-SHAPING
Q19,20 LPF
Q22,24 LED DRIVER
Q14,23 IND KILLER
Q26 AM STEREO BUFFER AMP
Q1 P001
Q2,5,6 2SC535
Q3 2SC1923
Q4 2SK168
Q7 PA3007-A
Q8~10,14,15,19~24 2SC2603/A/
Q11~13 2SA1115/A/
Q17 PA4006-A
Q13 M54922P
Q25 LA1247
Q26 2SC461
D1 KV1320A-4
D11 KV1226-Y
D12 WZ-290
D13,14 MZ-100
D3~5,7~10 1S1555
D15 SZ-027
X1 CRYSTAL RESONATOR ASS-016
F1~3 ATF-107
F4,5 ATF-089
F6 ATF-121
F7 ATF-125
L1 ATC-155
L2 ATC-142
L3 ATC-114
L4,7 ATH-049
L6 ATC-077
T1 ATE-039
T2 ATE-055
T3 ATB-068
T4 ATB-067
VR1 MUTING LEVEL ADJ C92-048
VR2 VCO ADJ ACP-036
VR3 AUTO PILOT CANCEL ADJ ACP-037
CONTROL Ass'y GWK-196
Q1 LED DRIVER
Q2 VCA CONTROLLER
Q7,8 BCD TO 7 SEGMENT DECODER
Q204,205 2SC2603/A/
Q202,203 2SA1115/A/
D201,203 2-1K261
D202 1S1555 or 1S2473 or US1035
Q202,203 INVERTER AMP
Q204 SWITCHING (AUTO STOP→ON)
Q205 SWITCHING (9kHz→ON)
CONNECTOR Ass'y
S300 AM CHANNEL STEP ASH-015
SWITCH Ass'y
(TREBLE FLAT)
(BASS FLAT)
(BASS DOWN)
(TREBLE UP)
(BASS UP)
(TREBLE DOWN)
(B)
(A)
(VOLUME MEMORY)
TREBLE DOWN
VCA VOL
SWITCHES
S1 PRESET (B) ON - OFF
S2 PRESET (A) ON - OFF
S3 VOLUME (DOWN) ON - OFF
S4 VOLUME (UP) ON - OFF
S6 TONE PRESET (B) ON - OFF
S7 TONE PRESET (A) ON - OFF
S8 MUTING ON - OFF
1
2
3
4
5
6

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.


A
B
C
D
Q5,6 FM IF AMP
TUNING T.P.
Q11 FM IF KILLER
Q7 FM IF AMP & DET
SIGNAL T.P.
Q12 SWITCHING (AM→ON)
Q13 SWITCHING (FM→ON)
S39 FM DE-EMPHASIS ASH-016
Q17 FM MPX & MUTING
VCO T.P.
CONTROL Ass'y GWK-196
Q1 LED DRIVER
Q2: VCA CONTROLLER
Q3 LED DRIVER
Q7,8 BCD TO 7 SEGMENT DECODER
Q9,10 DIGIT CONTROL
Q11 SWITCHING (FM→ON)
Q12 DIGIT CONTROL (CLOCK→OFF)
Q14 SWITCHING (CLOCK→ON)
Q4 INVERTER
Q5 BCD DECODER
Q19~37 LED DRIVER
X1 CERAMIC RESONATOR ASS-017
D101~108 STATION CALL
Q6 CH. SELECTOR FUNCTION CONTROLLER
C15~18 LED DRIVER
BALANCE
MONITOR
(TREBLE) (FLAT)
(BASS) (FLAT)
(BASS) (DOWN)
(TREBLE) (UP)
(BASS) (UP)
(TREBLE) (DOWN)
(VOLUME) (MEMORY)
TONE MEMORY
(MUTING)
(LOUDNESS)
(STEREO)
(SIGNAL)
(SPEAKER)
Q204,205 2SC2603/A/
Q202,203 2SA1115/A/
D201,203 2-1K261
D202 1S1555 or 1S2473 or US1035
Q202,203 INVERTER AMP
Q204 SWITCHING (AUTO STOP→ON)
Q205 SWITCHING (9kHz→ON)
CONNECTOR Ass'y
S300 AM CHANNEL STEP ASH-015
SWITCH Ass'y

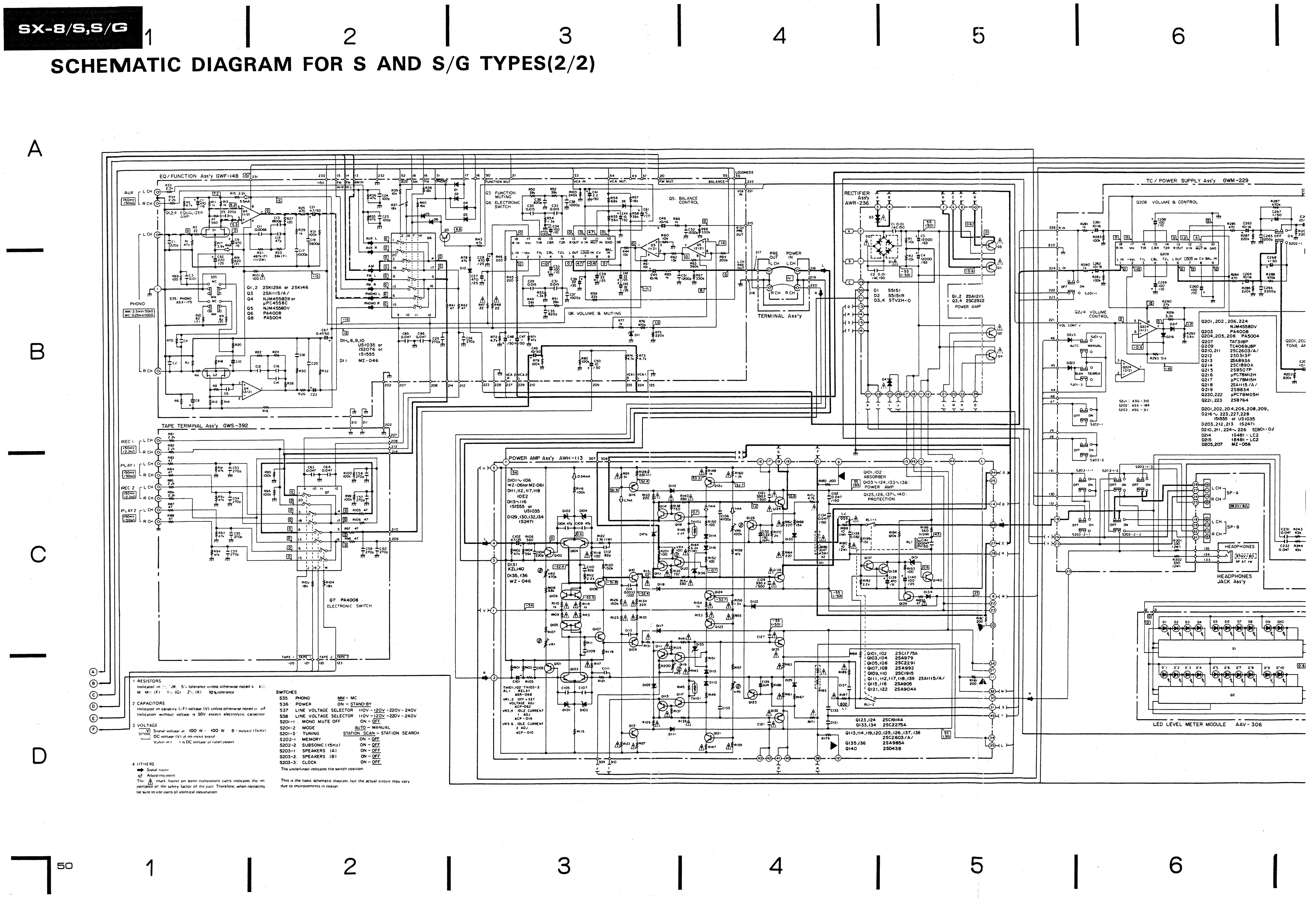
Q1,3	TD6301AP	D1~7	2-1K261
Q2	PD6011	D12~26	1S1555 or 1S2473 or US1035
Q4	TC4049BP		
Q5	M74LS42P	D101~108	AEL-365
Q6	PD6010	D109	AAL-307
Q7,8	TC5022BP	D110	AEL-392
Q9,11,14~19,23~26 Q28~33	2SA1115/A/	D111	AEL-391
Q10,12,20~22,34~37	2SC2603/A/	D112	AEL-378

SWITCHES

S1	PRESET (B)	ON - OFF
S2	PRESET (A)	ON - OFF
S3	VOLUME (DOWN)	ON - OFF
S4	VOLUME (UP)	ON - OFF
S6	TONE PRESET (B)	ON - OFF
S7	TONE PRESET (A)	ON - OFF
S8	MUTING	ON - OFF
S9	TREBLE (DOWN)	ON - OFF
S10	TREBLE (FLAT)	ON - OFF
S11	TREBLE (UP)	ON - OFF
S12	LOUDNESS	ON - OFF
S13	BASS (DOWN)	ON - OFF
S14	BASS (FLAT)	ON - OFF
S15	BASS (UP)	ON - OFF
S16	BALANCE (L)	ON - OFF
S17	BALANCE (R)	ON - OFF
S18	TUNING (UP)	ON - OFF
S19	TUNING (DOWN)	ON - OFF
S20	TUNING (STOP)	ON - OFF
S21	STATION CALL (1)	ON - OFF
S22	STATION CALL (2)	ON - OFF
S23	STATION CALL (3)	ON - OFF
S24	STATION CALL (4)	ON - OFF
S25	STATION CALL (5)	ON - OFF
S26	STATION CALL (6)	ON - OFF
S27	STATION CALL (7)	ON - OFF
S28	STATION CALL (8)	ON - OFF
S29	FUNCTION (PHONO)	ON - OFF
S30	FUNCTION (AUX / VIDEO)	ON - OFF
S31	FUNCTION (TAPE 1)	ON - OFF
S32	FUNCTION (TAPE 2)	ON - OFF
S33	FUNCTION (FM)	ON - OFF
S34	FUNCTION (AM)	ON - OFF
S39	FM DE-EMPHASIS	50μS - 75μS
S300	AM CHANNEL STEP	9kHz - 10kHz

The underlined indicates the switch position

SCHEMATIC DIAGRAM FOR S AND S/G TYPES(2/2)


1
2
3
4
5
6
A
B
C
D
EQ/FUNCTION Ass'y GWF-148
AUX
PHONO
Q1,2,4 EQUALIZER AMP
Q3 FUNCTION MUTING
Q6 ELECTRONIC SWITCH
Q5: BALANCE CONTROL
Q8 VOLUME & MUTING
Q1,2 2SK129A or 2SK146
Q3 2SA1115/A/
Q4 NJM4558DX or μPC4558C
Q5 NJM4558DV
Q6 PA4008
Q8 PA5004
D1~6,9,10 US1035 or 1S2076 or 1S1555
D11 MZ-046
S35: PHONO ASX-175
TAPE TERMINAL Ass'y GWS-392
REC 1
PLAY 1
REC 2
PLAY 2
Q7 PA4008 ELECTRONIC SWITCH
RECTIFIER Ass'y AWR-236
D1 S5151
D2 S5151R
D3,4 STV2H-O
Q1,2 2SA1215
Q3,4 2SC2922
POWER AMP
TERMINAL Ass'y
PRE OUT
POWER IN
POWER AMP Ass'y AWH-113
D101~106 WZ-061 or MZ-061
D111,112,117,118 10E2
D113~116 1S1555 or US1035
D129,130,132,134 1S2471
D131 KZL140
D135,136 WZ-046
TH101,102, TH103-2
RL1 RELAY ASR-068
VR1,2 OFF-SET VOLTAGE ADJ ACP-062
VR3,4 IDLE CURRENT ADJ ACP-019
VR5,6 IDLE CURRENT ADJ ACP-010
Q101,102 ABSORBER
Q103~124,133~136 POWER AMP
Q125,126,137~140 PROTECTION
Q101,102 2SC1775A
Q103,104 2SA979
Q105,106 2SC2291
Q107,108 2SA992
Q109,110 2SC1915
Q111,112,117,118,139 2SA1115/A/
Q115,116 2SA905
Q121,122 2SA904A
Q123,124 2SC1914A
Q133,134 2SC2275A
Q113,114,119,120,125,126,137,138 2SC2603/A/
Q135,136 2SA985A
Q140 2SD438
TC/POWER SUPPLY Ass'y GWM-229
Q208 VOLUME & CONTROL
Q224 VOLUME CONTROL
Q201,202,206,224 NJM4558DV
Q203 PA4008
Q204,205,208 PA5004
Q207 TA7318P
Q209 TC4069UBP
Q210,211 2SC2603/A/
Q212 2SD313P
Q213 2SA893A
Q214 2SC1890A
Q215 2SB507P
Q216 μPC78M12H
Q217 μPC78M15H
Q218 2SA1115/A/
Q219 2SB834
Q220,222 μPC78M05H
Q221,223 2SB764
D201,202,204,206,208,209, D216~223,227,228 1S1555 or US1035
D203,212,213 1S2471
D210,211,224~226 S1B01-02
D214 IG481-LC2
D215 IB481-LC2
D205,207 MZ-056
S201-1
S201-2
S201-3
S202-1
S202-2
S203-1
S203-2
S203-3
SP-A
SP-B
HEADPHONES
HEADPHONES JACK Ass'y
LED LEVEL METER MODULE AAV-306

1 RESISTORS
Indicated in Ω, ¼W, 5% tolerance unless otherwise noted k: kΩ,
M: MΩ, (F): 1%, (G): 2%, (K): 10% tolerance

2 CAPACITORS
Indicated in capacity (μF) voltage (V) unless otherwise noted p: pF
Indication without voltage is 50V except electrolytic capacitor

3 VOLTAGE
V Signal voltage at 100 W + 100 W 8Ω output (1kHz)
DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power

4 OTHERS
➡ Signal route
Adjusting point
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

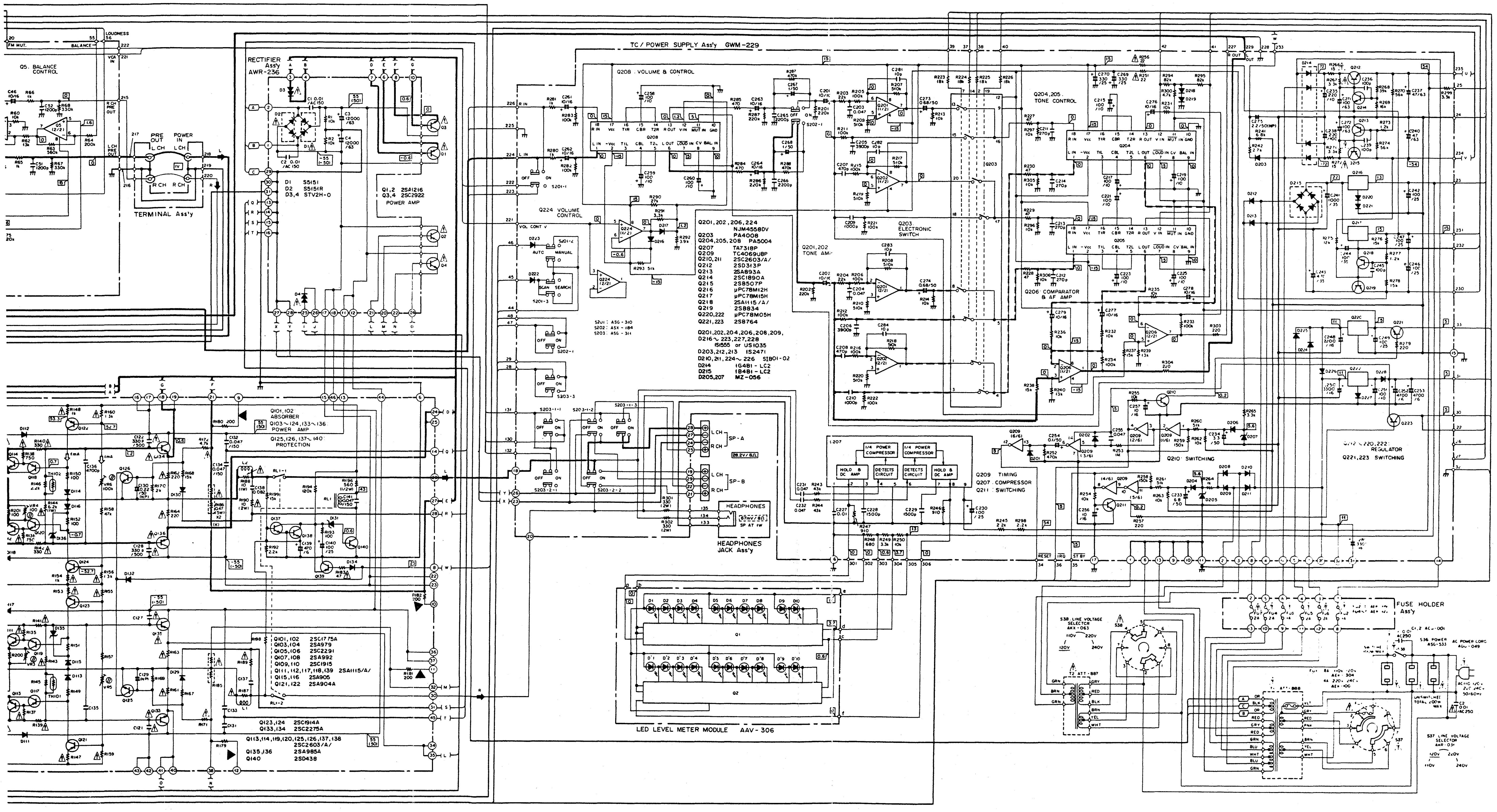
SWITCHES

S35	PHONO	MM - MC
S36	POWER	ON - STAND-BY
S37	LINE VOLTAGE SELECTOR	110V - 120V - 220V - 240V
S38	LINE VOLTAGE SELECTOR	110V - 120V - 220V - 240V
S201-1	MONO MUTE OFF	ON - OFF
S201-2	MODE	AUTO - MANUAL
S201-3	TUNING	STATION SCAN - STATION SEARCH
S202-1	MEMORY	ON - OFF
S202-2	SUBSONIC (15Hz)	ON - OFF
S203-1	SPEAKERS (A)	ON - OFF
S203-2	SPEAKERS (B)	ON - OFF
S203-3	CLOCK	ON - OFF

The underlined indicates the switch position.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.


4
5
6
7
8
9
A
B
C
D
TC / POWER SUPPLY Ass'y GWM-229
RECTIFIER Ass'y AWR-236
D1 S5151
D2 S5151R
D3,4 STV2H-0
Q1,2 2SA1216
Q3,4 2SC2922
POWER AMP
TERMINAL Ass'y
PRE OUT
POWER IN
Q5 BALANCE CONTROL
Q208 VOLUME & CONTROL
Q224 VOLUME CONTROL
Q201,202 TONE AMP
Q203 ELECTRONIC SWITCH
Q204,205 TONE CONTROL
Q206 COMPARATOR & AF AMP
Q201,202,206,224 NJM4558DV
Q203 PA4008
Q204,205,208 PA5004
Q207 TA7318P
Q209 TC4069UBP
Q210,211 2SC2603/A/
Q212 2SD313P
Q213 2SA893A
Q214 2SC1890A
Q215 2SB507P
Q216 μPC78M12H
Q217 μPC78M15H
Q218 2SA1115/A/
Q219 2SB834
Q220,222 μPC78M05H
Q221,223 2SB764
D201,202,204,206,208,209,
D216～223,227,228
1S1555 or US1035
D203,212,213 1S2471
D210,211,224～226 SIB01-02
D214 1G4B1-LC2
D215 1B4B1-LC2
D205,207 MZ-056
S201 ASG-310
S202 ASX-184
S203 ASG-311
Q101,102 ABSORBER
Q103～124,133～136 POWER AMP
Q125,126,137～140 PROTECTION
Q101,102 2SC1775A
Q103,104 2SA979
Q105,106 2SC2291
Q107,108 2SA992
Q109,110 2SC1915
Q111,112,117,118,139 2SA1115/A/
Q115,116 2SA905
Q121,122 2SA904A
Q123,124 2SC1914A
Q133,134 2SC2275A
Q113,114,119,120,125,126,137,138 2SC2603/A/
Q135,136 2SA985A
Q140 2SD438
SP-A
SP-B
L CH
R CH
HEADPHONES
HEADPHONES JACK Ass'y
1/4 POWER COMPRESSOR
HOLD & DC AMP
DETECTS CIRCUIT
Q209 TIMING
Q207 COMPRESSOR
Q211 SWITCHING
Q210 SWITCHING
Q212～220,222 REGULATOR
Q221,223 SWITCHING
LED LEVEL METER MODULE AAV-306
FUSE HOLDER Ass'y
S38 LINE VOLTAGE SELECTOR AKX-063
S36 POWER
AC POWER CORD
S37 LINE VOLTAGE SELECTOR
T2 ATT-887
T1 ATT-888
RESET
IRQ
ST BY
VOL CONT V
AUTO
MANUAL
SCAN
SEARCH

CORRECTION TO SERVICE MANUAL

PIONEER

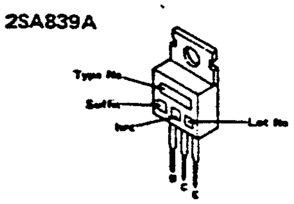
No. SI-A38015
Date. Dec. 14, 1983

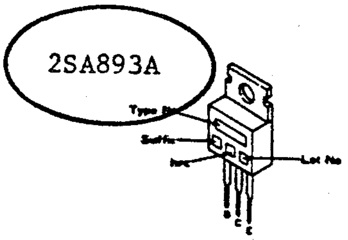
Eingegangen
23. Jan. 1984

MODEL: SX-8 [ARP-043]
PAGE: 24, 29 (Q213)

Please correct Service Manual as follows:

P. 24 ORIGINAL → CORRECTION





P. 29 ORIGINAL → CORRECTION

SEMICONDUCTORS (ORIGINAL)

Mark	Part No.	Symbol & Description
★★	NJM4558DV	Q201,Q202,Q206,Q224
★★	PA4008	Q203
★★	PA5004	Q204,Q205,Q208
★★	TC4069UBP	Q209
★★	TA7318P-A	Q207
★★	μPC78M05H	Q220,Q222
★★	μPC78M12H	Q216
★★	μPC78M15H	Q217
★★	2SA839A	Q213
★★	2SA1115/A/	Q218
★★	2SB507P	Q215
★★	2SB764	Q221,Q223
★★	2SB834	Q219
★★	2SC1890A	Q214
★★	2SC2603/A/	Q210,Q211

SEMICONDUCTORS (CORRECTION)

Mark	Part No.	Symbol & Description
★★	NJM4558DV	Q201,Q202,Q206,Q224
★★	PA4008	Q203
★★	PA5004	Q204,Q205,Q208
★★	TC4069UBP	Q209
★★	TA7318P-A	Q207
★★	μPC78M05H	Q220,Q222
★★	μPC78M12H	Q216
★★	μPC78M15H	Q217
★★	2SA893A	Q213
★★	2SA1115/A/	Q218
★★	2SB507P	Q215
★★	2SB764	Q221,Q223
★★	2SB834	Q219
★★	2SC1890A	Q214
★★	2SC2603/A/	Q210,Q211

PIONEER ELECTRONIC CORPORATION

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